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RADIATION CHEMISTRY

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Alexandria, Va. 22314

NOVEMBER 1977

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Cameron Station
Alexandria, Va. 22314

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17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

Supersedes AD-723 940

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

*Radiation Chemistry	Copolymers
Bibliographies	Radioactive Decay
Indexes	Air Pollution
Degradation	Catalysts
Polymers	Deoxyribonucleic Acids *(See Reverse)*

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This bibliography contains unclassified-unlimited citations on Radiation Chemistry; chemistry of radiation effects on organic, inorganic, and polymeric components. There is also a cross-section of references on instrumentation and techniques employed in measuring these reactions, and their rates. The four computer-generated indexes provi-ed are Corporate Author-Monitoring Agency, Subject, Title and Personal Author.

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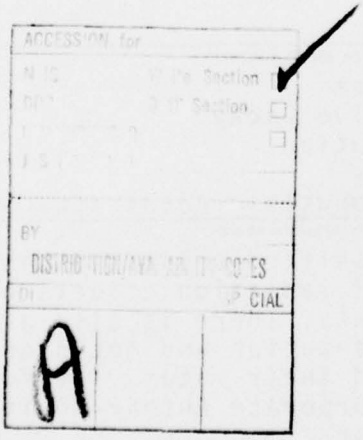
Item 19 KEY WORDS (Cont'd)

Plastics
Water Chemistry
Alkali Metal Compounds
Electron Paramagnetic Resonance
Crystal Structure
Organic Sulfur Compounds
Halogenated Hydrocarbons
Test Methods
Laboratory Equipment
Electromagnetic Radiation
Semiconductors
Enzymes
Rocket Propellants
Complex Compounds
Explosives
Radiation Effects
Aromatic Compounds
Aliphatic Compounds



FOREWORD

This bibliography contains 194 unclassified-unlimited citations on *Radiation Chemistry*.

Entries have been selected from references processed into the Defense Documentation Center data bank from January 1960 to September 1977.

This report supersedes DDC report bibliography on *Radiation Chemistry*, AD-723 940, DDC-TAS-71-19-1, dated May 1971.

Individual entries are arranged in AD number sequence under the heading bibliographic references. Computer-generated indexes of Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.

BY ORDER OF THE DIRECTOR, DEFENSE LOGISTICS AGENCY

OFFICIAL

Hubert E. Sauter

HUBERT E. SAUTER
Administrator
Defense Documentation Center

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 401 113
DENVER RESEARCH INST COLO

BASIC STUDIES ON RADIATION ENERGY TRANSFER MECHANISMS OF CHEMICAL SYSTEMS (U)

DEC 62 1V BOHNER,GEORGE E.;
CONTRACT: DA44 177TC725
MONITOR: TRECOM 62-90

UNCLASSIFIED REPORT

DESCRIPTORS: *ENERGY, *ORGANIC COMPOUNDS, *RADIATION CHEMISTRY, ADDITIVES, BENZENE (FUSED), BENZENE (IND), BENZENE (MONOSUBSTITUTED), BENZENE (POLY USAGE), CHEMICAL REACTIONS, CHROMATOGRAPHIC ANALYSIS, CYCLOALKANES (6M), CYCLOALKANES (IND), CYCLOALKANES (SATURATED), DECOMPOSITION, FREE RADICALS, INHIBITION, ORGANIC SOLVENTS, POLYMERIZATION, RADIATION EFFECTS, RINGS-2, THEORY (U)
IDENTIFIERS: BENZENE (FUSED), BENZENE (IND), BENZENE (POLY USAGE), BENZENE (MONOSUBSTITUTED), CYCLOALKANES (IND), CYCLOALKANES (SATURATED), CYCLOALKANES (6M), RINGS-2 (U)

BENZENE, BIPHENYL, AND NEPHTHALENE WERE THE PRINCIPAL PROTECTIVE ADDITIVES STUDIED IN PROTECTING CYCLOHEXANE FROM DEGRADATION BY HIGHENERGY IRRADIATION; FREE RADICAL MECHANISM AND RADIOLYTIC DEGRADATION.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 403 022
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST

A RAPID RADIOCHEMICAL PROCEDURE FOR TIN, (U)

FEB 63 17P LOVE,AAND D.L.;
REPT. NO. USNRDL-TR-632

UNCLASSIFIED REPORT

DESCRIPTORS: *RADIATION CHEMISTRY, *TIN, *ISOTOPE SEPARATION, ISOTOPES, BOROHYDRIDES, SODIUM COMPOUNDS, ANTIMONY, TIN COMPOUNDS, HYDRIDES, ANTIMONY COMPOUNDS, DECONTAMINATION, FISSION PRODUCTS, ARSENIC, IODINE, TELLURIUM, TEST EQUIPMENT, HALF LIFE. (U)

A VERY RAPID RADIOCHEMICAL PROCEDURE HAS BEEN DEVELOPED FOR THE ISOLATION OF RADIOISOTOPES OF TIN FROM THEIR FISSION-PRODUCT ISOBARS. AN IR RADIATED URANIUM SOLUTION CONTAINING TIN AND ANTIMONY CARRIERS IS ADDED TO A SOLUTION OF SODIUM BOROHYDRIDE. THE VOLATILE STANNANE (SNH4) FORMED IS DECOMPOSED IN A HOT QUARTZ TUBE TO THE METAL, WHICH IS COLLECTED ON A COLD SURFACE. STIBINE (SBH3), WHICH IS ALSO FORMED UNDER THESE CONDITIONS, IS REMOVED BY ABSORBTION ON AN 'ASCARITE' COLUMN. THE TIN CHEMICAL YIELD RANGES BETWEEN 15% FOR AN SB DECONTAMINATION FACTOR OF 20,000 TO 60% FOR AN SB DECONTAMINATION FACTOR OF 1,000. THE TIME REQUIRED FOR SEPARATION OF THE TIN METAL FROM THE OTHER FISSION PRODUCT ELEMENTS IS ABOUT 10 SEC. DECONTAMINATION FACTORS OF OTHER SN DESCENDENTS ARE: I 70,000, AND TE > 20, 000. ARSENIC IS ALSO VOLATILIZED AS THE HYDRIDE; HOWEVER, IT IS NOT NECESSARY TO ELIMI NATE IT IN THIS WORK FOR THE DETERMINATION OF THE SN FISSION YIELD. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 415 654
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION-THERMAL CRACKING OF HYDROCARBONS, (U)

APR 63 1V TOPCHIYEV ,A. V. ;POLAK , L. S. ;CHERNYAK ,N. YA. ;GLUSHNEV ,V. YE. ; GLAZUNOY,P. YA. ;
MONITOR: FTD TT62 1930

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM RADIOSKTIVNYYE ISOTOPY I YADERNYYE IZLUCHENIYA V NARODNOM KHOZYAYSTVE SSSR, RIGA, PP. 206-210, 1960.

DESCRIPTORS: (*ORGANIC COMPOUNDS, PROCES), (*RADIATION CHEMISTRY, PROCESSING), (*PRODUCTION, HYDROCARBONS, GAMMA RAYS, INDIUM ALLOYS, GALLIUM ALLOYS, POWDERS, RADIO, HYDROGEN, ALKANES, TEMPERATURE. (U)

RADIATION THERMAL CRACKING OF HYDROCARBONS. DEPENDENCE OF RADIATION HEMICAL YIELD OF HYDROCARBONS ON RADIATION THERMAL CRACKING TEMPERATURE.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 417 705
GENERAL DYNAMICS/FORT WORTH TEX

ELECTRON-SPIN MAGNETIC RESONANCE OF FREE-RADICAL INTERMEDIATES IN GAMMA-IRRADIATED HYDROCARBONS, (U)

APR 63 93P STAPLES,J.A.;
REPT. NO. NARF-63-4T, MR-N-299
CONTRACT: AF33 657 7201

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, HYDRO), (*HYDROCARBONS, RADIATION CHEMISTRY), FREE RADICALS, ELECTRONS, SPINNING(MOTION), RESONANCE, ALKENES, GAMMA RAYS, ISOTOPES, COBALT, TEST, WAXES, GAMMA RAY SPECTRA, THEORY, ATOMIC ENERGY LEVEL, TEST EQUIPMENT, TABLES(DATA), DATA. (U)
IDENTIFIERS: DODECANE (U)

RESULTS OF A STUDY OF THE CHARACTER AND ORIGIN OF THE ELECTRON-SPIN MAGNETIC-RESONANCE SPECTRA OF GAMMA-IRRADIATED HYDROCARBON COMPOUNDS ARE PRESENTED. THE COMPOUNDS EXAMINED INCLUDE SELECTED ALKANES, ALKENES, ALKYNES, BRANCHED ALKANES, AND CYCLOPARAFFINS. ALL IRRADIATIONS AND RESONANCE MEASUREMENTS WERE PERFORMED AT 77 K. SPECTRAL ANALYSIS WAS DIRECTED TOWARD IDENTIFICATION OF THE CHEMICAL SPECIES RESPONSI BLE FOR THE OBSERVED HYPERFINE PATTERNS. STRUC TURAL INTERPRETATION WFINED TO FREE-RADI CAL SPECIES RESULTING FROM CARBON-HYDROGEN AND CARBON-CARBON BOND SCISSION IN THE PARENT MOLE CULE. THESE RESULTS ARE INCORPORATED INTO AN EVALUATION OF THE CURRENT STATUS OF FREE-RADICAL SPECTRA FROM IRRADIATED HYDROCARBONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 422 205
AEROJET-GENERAL NUCLEONICS SAN RAMON CALIF

SELECTED SYNTHESIS BY FISSION FRAGMENT RECOIL. (U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT. NO. 1, 1 JULY-30 SEP 63, OCT 63 14P
REPT. NO. AN1048
CONTRACT: AF04 611 90
TASK: 314801

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*LIQUID ROCKET OXIDIZERS, SYNTHESIS (CHEMISTRY)), (*RADIATION CHEMISTRY, LIQUID ROCKET OXIDIZERS), FISSION, FISSION PRODUCTS, NITROGEN COMPOUNDS, FLUORIDES, FLUORINE, DOSIMETERS, RADIOCHEMISTRY, OXIDES, DETERMINATION, FLUORINE COMPOUNDS (U)
IDENTIFIERS: HYDRAZINE TETRAFLUORIDE (U)

A STUDY IS BEING CONDUCTED ON THE SYNTHESIS OF TWO HIGH-ENERGY LIQUID OXIDIZERS BY MEANS OF FISSION FRAGMENT RADIOLYSIS. IRRADIATION CAPSULES AND FISSILE FUEL WERE PROCURED AND CALIBRATION OF ENERGY DEPOSITION WAS BEGUN. MOST MATERIALS FOR THE IRRADIATIONS, INCLUDING NF3 AND N2F4, WERE ORDERED AND RECEIVED. ONE IRRADIATION WAS CONDUCTED TO GAIN HANDLING AND ANALYTICAL EXPERIENCE. A METHOD IS TO BE DEVELOPED UNDER A SUBCONTRACT FOR DIRECT DETERMINATION OF FLUORINE. IT APPEARS THAT FEWER CALIBRATION IRRADIATIONS WILL BE REQUIRED THAN THE TEN ORIGINALLY ESTIMATED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 423 525
RESEARCH AND TECHNOLOGY DIV BOLLING AFB D C

ELECTRON SPIN RESONANCE (ESR) STUDY OF GAMMA IRRADIATED SOLID ACETONITRILE. (U)

DESCRIPTIVE NOTE: REPT. FOR JAN-JUNE 63,
SEP 63 21P HARRAH,L. A. ;RONDEAU,R. E. ;ZAKANYCZ,S. ;HALE,D. ;DUNBAR,D. ;
PROJ: 7367
TASK: 736701
MONITOR: ASD TDR63 785

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON RESEARCH ON CHARACTERIZATION AND PROPERTIES OF MATERIALS.

DESCRIPTORS: (*ORGANIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ORGANIC COMPOUNDS), ORGANIC NITROGEN COMPOUNDS, COBALT, RADIOACTIVE ISOTOPES, SOLIDS, GAMMA RAYS, FREE RADICALS, ELECTRONS, SPINNING(MOTION), RESONANCE, CHROMATOGRAPHIC ANALYSIS, MASS SPECTROSCOPY, MAGNETIC FIELDS, CALIBRATION, HYDROGEN, ALKANES, HYPERFINE STRUCTURE (U)
IDENTIFIERS: ACETONITRILE, RADIOLYSIS, SUCCINONITRILE (U)

THE SOLID PHASE COBALT-60 RADIOLYSIS OF ACETONITRILE WAS INVESTIGATED. FREE RADICALS PRODUCED DURING THE EXPOSURE TO GAMMA RAYS WERE STUDIED WITH AN ELECTRON-SPIN RESONANCE SPECTROMETER AND THE FINAL PRODUCTS WERE DETERMINED BY GAS CHROMATOGRAPHY AND MASS SPECTROMETRY. PREDOMINANT PRODUCTS ARE HYDROGEN, METHANE, AND SUCCINONITRILE. THE REACTION PATHS TO THESE PRODUCTS ARE INFERRED FROM, AND CONSISTENT WITH, THE ESR SPECTRA OF THE TRAPPED FREE RADICALS. (UTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 423 856
STANFORD RESEARCH INST MENLO PARK CALIF

THE ROLE OF IONS IN THE RADIOLYSIS OF ORGANIC LIQUIDS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT., 1 MAR 62-31 AUG 63, NOV 63 47P SAMUEL,A. H. ;GOLUB,M. A. ; DANON,J. ;
CONTRACT: AF33 657 8205
PROJ: 7360
TASK: 736003
MONITOR: RTD TDR63 4133

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ORGANIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ORGANIC COMPOUNDS), (*IONS, RADIATION CHEMISTRY), SOLUTIONS(MIXTURES), ORGANIC SOLVENTS, TIN COMPOUNDS, CHLORIDES, GAMMA RAYS, ELECTRON BEAMS, MOLECULAR ISOMERISM, HYDROCARBONS, ALKENES, AROMATIC COMPOUNDS, BENZENE, POLYMERS, COPOLYMERIZATION, NUCLEAR MOLECULAR RESONANCE, SPECTRA (INFRARED) (U)
IDENTIFIERS: POLYISOPRENE, SQUALENE, TOLUENE (U)

IRRADIATION TO 3X10 TO THE 21ST POWER EV/G OF SOLUTIONS OF STANNIC CHLORIDE (SNCL4) IN TOLUENE AT 195 K BY 1-MEV ELECTRONS GAVE O- AND M- AND/OR P-CHLOROTOLUENE YIELDS (G, MOLECULES/100 EV) WHICH WERE UNAFFECTED BY CHANGES IN TEMPERATURE AND DOSE AND BY THE PRESENCE OF ETHYLENE AND NITRIC OXIDE, BUT ROSE WITH SNCL4 CONCENTRATION TO APPROACH A LIMITING TOTAL VALUE NEAR 0.2. WHEN ETHYLENE WAS PRESENT, G(TOTAL C9H12) WAS NEAR 0.01. WHEN CCL4 WAS SUBSTITUTED FOR SNCL4, A DIFFERENT PRODUCT PATTERN WAS FOUND. SQUALENE WAS IRRADIATED WITH CO-60 GAMMA RAYS AT ROOM TEMPERATURE AND WITH 1-MEV ELECTRONS AT 243 K. THE MAIN RADIATION -INDUCED EFFECTS, WITH THEIR G-VALUES AT ROOM TEMPERATURE, ARE LOSS OF UNSATURATION (4.6), CROSSLINKING (1.35), TRANS-CIS ISOMERIZATION (0.83), AND HYDROGEN EVOLUTION (0.58). MOST OF THE LOSS OF UNSATURATION IS ATTRIBUTED TO CYCLIZATION; IT OCCURS ONLY IN THE CROSSLINKED FRACTION. INCREASED YIELDS (ON THE BASIS OF ENERGY ABSORBED IN THE SOLUTE) WERE OBSERVED FOR THE CIS-TRANS ISOMERIZATION OF SQUALENE AND CIS- AND TRANS-POLYISOPRENE WHEN THESE WERE IRRADIATED IN BENZENE SOLUTION. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 428 142
TEMPLE UNIV PHILADELPHIA PA RESEARCH INST

(NO TITLE). (U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT. NO. 1, 1 OCT-31 DEC 63.
DEC 63 14P
CONTRACT: AF04 611 9555
PROJ: 3148
TASK: 3148 0 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, SCIENTIFIC RESEARCH), (*FREE RADICALS, SYNTHESIS (CHEMISTRY)), OXIDIZERS, OXYGEN COMPOUNDS, FLUORIDES, ATOMS, HYDROGEN, ELECTRICAL EQUIPMENT, GAMMA RAYS, PARAMAGNETIC RESONANCE, RADIATION EFFECTS (U)

THE EXISTENCE OF OF RADICALS HAS NOT YET BEEN PROVED. SINCE CERTAIN ELUSIVE OF-CONTAINING COMPOUNDS WOULD BE STRONG OXIDIZERS, IDENTIFICATION AND STUDY OF THESE RADICALS SHOULD ASSIST IN THE SYNTHESIS OF NEW OXIDIZERS. THE PURPOSE OF THIS RESEARCH IS TO PRODUCE, ISOLATE AND IDENTIFY THE OF., O2F. AND O3F. RADICALS. IT IS PLANNED TO PREPARE THESE RADICALS BY TWO METHODS: I. BOMBARDMENT OF OF2, O2F2, O3F2, AND O2BF4 WITH H ATOMS AT 77 K. OR LOWER. II. IRRADIATION OF THESE COMPOUNDS WITH Co60 GAMMA-RAYS AT 77 K. OR LOWER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 428 970
AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO

RADIATION PHYSICS: ITS IMPACT ON INSTRUMENTATION, (U)

SEP 63 18P BEAVIN,RUDY C. ;
MONITOR: ASD TDR63 697

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ''ASD 1963 SCIENCE AND ENGINEERING SYMPOSIUM'', 18-19 SEP 63.

DESCRIPTORS: (*RADIATION CHEMISTRY, INSTRUMENTATION), (*PHYSICS, RADIATION CHEMISTRY), FLIGHT CONTROL SYSTEMS, LOW ALTITUDE, ALTIMETERS, FUEL METERS, FUELS, MEASUREMENT, EXPERIMENTAL DATA, THEORY, RADIATION MEASURING INSTRUMENTS, ANALYSIS, GAMMA RAYS, RADIOACTIVE ISOTOPES (U)

PRESENTED IS AN ARGUMENT FOR EXPLOITING RADIATION PHYSICS FOR THE SOLUTION OF PROBLEMS IN THE INSTRUMENTATION AREA. A BRIEF REVIEW IS GIVEN OF BASIC PHYSICS CONNECTED WITH RADIATION. SEVERAL PROBLEMS IN THE FLIGHT CONTROL AREA ARE STATED AND POSSIBLE SOLUTIONS PRESENTED USING RADIATION PHYSICS CONCEPTS. THREE OF THESE PROBLEMS, LOW ALTITUDE ALTIMETRY, HIGH ALTITUDE ALTIMETRY, AND FUEL MASS MEASUREMENT, ARE EXAMINED IN DETAIL AND EXPERIMENTAL AND ANALYTICAL RESULTS GIVEN. A PROGRAM PHILOSOPHY AND THE ESTABLISHMENT OF AN IN-HOUSE EXPERIMENTAL FACILITY FOR EXPLOITATION OF RADIATION PHYSICS ARE ALSO REPORTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 429 156
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD
MASS

THE FERROUS-FERRIC DOSIMETER: A REVIEW, (U)

DEC 63 21P BURKE,EDWARD A. ;
MONITOR: AFCRL 63 587

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION MEASURING INSTRUMENTS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, RADIATION MEASURING INSTRUMENTS), IRON COMPOUNDS, SULFATES, IONS, AMMONIUM COMPOUNDS, CHEMICAL REACTIONS, RADIATION EFFECTS, OXIDATION, RADIOMETERS, SPECTROPHOTOMETERS (U)
IDENTIFIERS: CHEMICAL DOSIMETERS, IRON SULFATE (U)

THE CHARACTERISTICS, PREPARATION, AND USE OF THE FERROUS-FERRIC DOSIMETER ARE REVIEWED IN DETAIL. THIS INCLUDES A DISCUSSION OF THE DOSE RANGE, DOSE RATE DEPENDENCE, ENERGY DEPENDENCE, AND TEMPERATURE EFFECTS. FOR PHOTONS WITH ENERGIES IN EXCESS OF 6 KEV THE IRRADIATION YIELD MAY BE REPRESENTED BY THE EXPRESSION G = 15.61 - 15.43/E, WHERE E IS THE MEAN PHOTON ENERGY IN KEV AND G IS THE NUMBER OF FERROUS IONS OXIDIZED PER 100 EV OF ENERGY ABSORBED. SEVERAL METHODS OF MEASURING FERRIC ION CONCENTRATION ARE DESCRIBED, INCLUDING THE CONVENTIONAL SPECTROPHOTOMETRIC DETERMINATION OF FERRIC AND FERROUS ION AND THE VERY SENSITIVE RADIOMETRIC MEASUREMENT OF FERRIC ION. A CONCISE SUMMARY OF ALL THE INFORMATION NECESSARY FOR ROUTINE APPLICATION OF THIS DOSIMETER IS GIVEN AT THE END OF THE REPORT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 430 560
FRANKFORD ARSENAL PHILADELPHIA PA

RESEARCH CONDUCTED ON SECRETARY OF THE ARMY RESEARCH AND STUDY FELLOWSHIP IN THE GENERAL FIELD OF PHYSICAL ORGANIC CHEMISTRY, (U)

NOV 63 39P RADELL,J. ;
REPT. NO. FA-R-1698

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, SCIENTIFIC RESEARCH), (*COMPLEX COMPOUNDS, UREA), (*ALKYNES, POLYMERIZATION), (*POLYMERS, ALKYNES), GAMMA RAYS, AROMATIC COMPOUNDS, MOLECULAR ROTATION, OXYGEN HETEROCYCLIC COMPOUNDS, THIOLS, ESTERS, CARBOXYLIC ACIDS, BROMINE COMPOUNDS, IODINE COMPOUNDS, DOSIMETERS, SYNTHESIS (CHEMISTRY), OPTICAL PROPERTIES (U)
IDENTIFIERS: INCLUSION COMPOUNDS (U)

A GENERAL REVIEW OF THE VARIOUS ACTIVITIES OF THE AUTHOR IN THE GENERAL FIELD OF PHYSICAL ORGANIC CHEMISTRY WHILE ON A SECRETARY OF THE ARMY RESEARCH AND STUDY FOLLOWSHIP IS PRESENTED. SOME GENERAL OBSERVATIONS ARE GIVEN WHICH RESULTED FROM VISITS TO VARIOUS LABORATORIES IN ISRAEL AND WESTERN EUROPE. IN ADDITION, ALL THE PUBLISHED, PRESENTED, AND COMPLETED RESEARCH OF THE AUTHOR WHICH OCCURRED DURING THIS FELLOWSHIP PERIOD IS PRESENTED OR SUMMARIZED. THREE MAIN SUBJECTS WERE PURSUED; (1) EFFECT OF GAMMA RADIATION ON OPTICALLY ORGANIC COMPOUNDS; (2) UREA INCLUSION COMPOUNDS; AND (3) ENERGETIC ACETYLENIC COMPOUNDS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 434 046
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

RADICAL YIELDS IN IRRADIATED AROMATICS, (U)

JAN 64 33P MCANDREWS,J. I. ;ANDERSON, T. H. ;MARTIN,S. B. ;

REPT. NO. USNRDL-TR-718
PROJ: SR011-01-01
TASK: 0401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, AROMATIC COMPOUNDS), (*FREE RADICALS, CRYOGENICS), ALCOHOLS, BENZENE, BIPHENYL, ELECTRONS, SPINNING(MOTION), RESONANCE, CYCLOHEXENES, HYDROCARBONS (U)
IDENTIFIERS: METHYL ALCOHOL, NAPHTHALENE, TOLUENE (U)

THE RELATIVELY HIGH EFFICIENCY OF PRODUCTION OF FREE RADICALS WHICH BECOME STABILIZED AT LIQUID NITROGEN TEMPERATURE DURING THE RADIOLYSIS OF SEVERAL AROMATIC HYDROCARBONS DEMONSTRATES THE QUANTITATIVE IMPORTANCE OF THESE INTERMEDIATES IN THE MECHANISM OF RADIATION DECOMPOSITION. THE REQUIRED MEASUREMENT OF G(R.) VALUES NECESSITATED THE INDIRECT APPROACH OF COMPARING PARTIALLY SATURATED ESR ABSORPTION SPECTRA AT HIGH POWERS AND THEN EVALUATING THE EXTENT OF SATURATION IN AN INDEPENDENT MEASUREMENT. G9R.0 VALUES ARE: BENZENE, 0.32; TOLUENE, 0.53; BIPHENYL AND NAPHTHALENE, 0.10. THE RESULTS AVERAGE ABOUT ONE-THIRD OF THE CORRESPONDING VALUES FOR RADIOLYSIS AT ROOM TEMPERATURE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 455 623
NAVAL AIR ENGINEERING CENTER PHILADELPHIA PA AERONAUTICAL MATERIALS LAB

UTILIZATION OF GAMMA RADIATION TO ENHANCE PROPERTIES OF POLYMERS AND TO INITIATE POLYMERIZATION OF MONOMERS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, 23 MAR-15 DEC 64,
DEC 64 16P HARGREAVES,G. ;HOWERTON,W. W. ;
PROJ: NAEC-AML(36)-R360FR101

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, POLYMERS), (*POLYMERS, RADIATION CHEMISTRY), (*POLYMERIZATION, RADIATION CHEMISTRY), REVIEWS, SCIENTIFIC RESEARCH, GAMMA RAYS, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES, DAMAGE, RADIATION EFFECTS, BIBLIOGRAPHIES, POLYETHYLENE PLASTICS, POLYVINYL CHLORIDE, HALOCARBON PLASTICS, SILICONE PLASTICS, LAMINATED PLASTICS, ACRYLIC RESINS, NYLON, STYRENE PLASTICS (U)

GAMMA RADIATION TO ENHANCE POLYMER PROPERTIES AND INITIATE POLYMERIZATION OF MONOMERS.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 455 716
ATOMIC ENERGY OF CANADA LTD CHALK RIVER (ONTARIO)

ENERGY TRANSFER IN THE RADIOLYSIS OF CYCLOPENTANE-CYCLOHEXANE MIXTURES, (U)

64 8P STONE, J. A. ;
2081

UNCLASSIFIED REPORT
REPRINT FROM JNL. OF CHEMISTRY, 42, PP. 2872-2879, 1964. (COPIES NOT SUPPLIED BY DDC)
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, CYCLOHEXANES), (*CYCLOPENTANES, RADIATION CHEMISTRY), (*CYCLOHEXANES, MIXTURES), ENERGY, DEUTERIUM COMPOUNDS, FREE RADICALS, EXCHANGE REACTIONS, HYDROGEN, MOLECULAR ASSOCIATION, INHIBITION, IODINE, CARBON TETRACHLORIDE (U)

ENERGY TRANSFER IN THE RADIOLYSIS OF CYCLOPENTANE-CYCLOHEXANE MIXTURES HAS BEEN STUDIED BY OBSERVING THE YIELDS OF HD AND D2 OBTAINED WHEN SMALL AMOUNTS OF CYCLOHEXANE D12 ARE ADDED. ENERGY MIGRATION OCCURS FROM CYCLOPENTANE TO CYCLOHEXANE BUT THIS TRANSFER CAN BE PREVENTED BY THE ADDITION OF CARBON TETRACHLORIDE OR IODINE. THE RELATIVE YIELDS OF THE DIMERS (C6H11)2, C5H9C6H11, AND (C5H9)2 SHOW THAT THE C6H11 AND C5H9 RADICALS, WHICH ARE THE PRECURSORS OF THE DIMERS, CAN ABSTRACT HYDROGEN ATOMS FROM THE SOLVENT AND MAY THUS CHANGE THEIR IDENTITY. ADDED IODINE OR CARBON TETRACHLORIDE REMOVES THE DIFFUSING RADICALS, AND THE RESIDUAL DIMER YIELD, WHICH IS UNAFFECTED BY SOLUTE, HAS A COMPOSITION DETERMINED SOLELY BY THE COMPOSITION OF THE MIXTURES. THE YIELDS OF CYCLOHEXENE AND CYCLOPENTENE SHOW EVIDENCE OF BOTH ENERGY TRANSFER AND RADICAL CHANGE OF IDENTITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 461 232
PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

MECHANISM OF THE SHIELDING EFFECT OF AROMATIC AMINES DURING RADIOLYSIS OF POLYMERS. SENSITIZED FORMATION OF AMINE-ION RADICALS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
APR 65 9P BAGDASAR'YAN,KH. S. ;
KRONGAUZ,V. A. ;KARDASH,N. S. ;
MONITOR: PA TM-1483

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM DOKLADY AKADEMII NAUK SSSR, 144:1, PP. 101-104, 1962.

DESCRIPTORS: (*RADIATION CHEMISTRY, AMINES), (*ACRYLIC RESINS, RADIATION CHEMISTRY), (*AMINES, RADIATION CHEMISTRY), AROMATIC COMPOUNDS, POLYMERS, GAMMA RAYS, RADIOPROTECTIVE AGENTS, SHIELDING, FREE RADICALS, ABSORPTION SPECTRA, HYDRAZINES, REACTION KINETICS, US(U)
IDENTIFIERS: DIPHENYLPICRYLHYDRAZYL (U)

THE SHIELDING EFFECT OF AROMATIC AMINES ON THE RADIATION DESTRUCTION OF POLYMETHYLMETHACRYLATE WAS INVESTIGATED. THE ANTI-RADIATION EFFECT OF BETA-NAPHTHYLAMINE, PHENYL-BETA-NAPHTHYLAMINE, DIPHENYLAMINE, AND TRIPHENYLAMINE WAS ALSO INVESTIGATED. THE EFFECT OF DIPHENYLPICRYLHYDRAZYL (DPPH) ON THE DESTRUCTION OF POLYMETHYLMETHACRYLATE WAS INVESTIGATED ALSO. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 463 911
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

THE RADIOLYTIC DECOMPOSITION OF MONOMETHYLHYDRAZINE ROCKET FUEL, (U)

APR 65 18P SHELBERG,W. E. ;
REPT. NO. USNRDL-TR-843
PROJ: SR011 01 01
TASK: 0401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*METHYL HYDRAZINES, DECOMPOSITION), (*DECOMPOSITION, METHYL HYDRAZINES), (*RADIATION CHEMISTRY, METHYL HYDRAZINES), LIQUID ROCKET FUELS, RADIATION EFFECTS, SIMULATION, GAMMA RAYS, SPACE ENVIRONMENTS, ADITIVES, FREE RADICALS, REACTION KINETICS, ALKENES, ACRYLIC RESINS, CARBON TETRACHLORIDE, STORAGE, STABILITY (U)
IDENTIFIERS: SCAVENGERS (U)

INVESTIGATIONS WERE MADE OF THE POSSIBILITY OF SUPPRESSING THE GENERATION OF NONCONDENSABLE GASES WHEN MONOMETHYLHYDRAZINE (MMH) ROCKET FUEL IS SUBJECTED TO IONIZING RADIATION. MMH PRODUCES MORE THAN TWICE ITS VOLUME OF GAS (MEASURED AT 25 C AND 1 ATM.) CONSISTING OF HYDROGEN, NITROGEN AND METHANE WHEN IRRADIATED TO NEARLY 10 TO THE 7TH POWER RADS WITH GAMMA RAYS. AN ATTEMPT AT GAS SUPPRESSION WAS MADE WITH CHEMICAL ADDITIVES THAT COULD RENDER FREERADICALS IMPOTENT BY REACTING WITH THEM. TWO NORMALLY EFFICIENT OLEFINIC ADDITIVES (FREERADICAL SCAVENGERS) FAILED TO SUPPRESS GAS EVOLUTION, THEREBY DEMONSTRATING THAT MMH DOES NOT DECOMPOSE RADIOLYTICALLY VIA FREE-RADICAL INTERMEDIATES. INSTEAD, IT DECOMPOSES VIA A MOLECULAR OR IONIC PROCESS. THE ADDITION OF CARBON TETRACHLORIDE AS A POTENTIAL, GASSUPPRESSING ADDITIVE ACTUALLY INCREASED GAS EVOLUTION ENORMOUSLY, AND THIS IS EXPLAINABLE ON THE BASIS THAT IT INITIATES A CHEMICAL CHAIN REACTION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 481 674 7/3 7/5
AKRON UNIV OHIO INST OF POLYMER SCIENCE

LOW TEMPERATURE POLYMERIZATION. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, 3 JAN-31 MAR 66,
APR 66 21P MORTON,MAURICE ;
CONTRACT: AF 04(611)-11378
PROJ: AFSC-3148

UNCLASSIFIED REPORT

DESCRIPTORS: (*POLYMERIZATION, LOW TEMPERATURE), (*RADIATION CHEMISTRY, POLYMERIZATION), POLYMERS, FLUORINE COMPOUNDS, ALDEHYDES, METALORGANIC COMPOUNDS, ALKENES, IONS, SENSITIVITY, ATTENUATION, LITHIUM, PROPAGATION, SOLUTIONS(MIXTURES), GAMMA RAYS, LEAD(METAL), SHIELDING, PROPENES, MANAGEMENT PLANNING AND CONTROL, ACRYLONITRILE POLYMERS (U)
IDENTIFIERS: ACETALDEHYDE/TRIFLUORO, BUTENES, ETHYL LITHIUM (U)

DURING THIS PERIOD WORK CONTINUED ON THE POLYMERIZATION OF TRIFLUOROACETALDEHYDE (FLUORAL) WITH ATTENTION BEING DIRECTED TO TWO ASPECTS OF THE REACTION, THE DOSE-RATE DEPENDENCE OF THE RADIATION INITIATED REACTION, AND THE POLYMERIZATION INITIATED BY ETHYL LITHIUM. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 601 493
BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS INFORMATION CENTER

THE BENEFICIAL USES OF RADIATION EFFECTS. (U)

JUN 64 27P DRENNAN,J. E. ;HAMMAN,D. J. ;WYLER,E. N. ;
REPT. NO. M25
CONTRACT: AF33 615 1124

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*NUCLEAR PARTICLES, POWER), (*RADIATION CHEMISTRY, ILLUMINATION), (*RADIOTHERAPY, RADIATION EFFECTS), TRACER STUDIES, RADIOACTIVE ISOTOPES, MEASURING INSTRUMENTS (U)

THE REPORT PRESENTS INFORMATION RELATIVE TO THE BENEFICIAL USES OF RADIATION EFFECTS. ALTHOUGH MANY STUDIES OF RADIATION EFFECTS HAVE BEEN CONDUCTED, MOST OF THE RESULTS REPORTED DISCUSS HOW THE DEVICE TESTED WAS DAMAGED OR DEGRADED BY THE RADIATION EXPOSURE. THE PREVIOUS LITERATURE HAS IMPLIED THAT THE RADIATION ENVIRONMENT IS MALIGNANT. THIS REPORT IS WRITTEN UNDER THE CONCEPT THAT ANY ENVIRONMENT WILL CAUSE CHANGES TO OCCUR IN A DEVICE, MATERIAL, OR STRUCTURE, AND THAT THE CHANGES SEEN WHEN THE ENVIRONMENT CONTAINS SIGNIFICANT AMOUNTS OF THE RADIATION ENERGIES ARE BENEFICIAL OR MALIGNANT DEPENDING ONLY ON THE PRECONCEIVED OBJECTIVES OF THE OBSERVER. THE REPORT SUMMARIZES BENEFICIAL USES OF THE PENETRATING ABILITIES OF THE RADIATION ENERGIES, THE USE OF RADIATION ENERGIES TO PROVIDE ILLUMINATION, THE EXPLOITATION OF THESE ENERGIES AS A SOURCE OF USEFUL POWER, AND THE USE OF THE RADIATION ENERGIES TO CHANGE MATERIALS AND THUS MAKE NEW OR IMPROVED PRODUCTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 602 163
BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS INFORMATION CENTER

MONTHLY ACCESSION LIST. ABSTRACT NO. 24313 TO 24385, PART I. (U)

DESCRIPTIVE NOTE: REPT. FOR 1-30 JUN 64,
JUL 64 30P
REPT. NO. MAL76
CONTRACT: AF33 615 1124 ,AF33 657 10085

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, MATERIALS), (*BIBLIOGRAPHIES, RADIATION CHEMISTRY), ABSTRACTS, METALS, CERAMIC MATERIALS, ORGANIC MATERIALS, POLYMERS, ELECTRONIC EQUIPMENT, SINGLE CRYSTALS, INORGANIC COMPOUNDS, DAMAGE, RADIATION EFFECTS, OSCILLATORS, ACCELEROMETERS, NUCLEAR REACTORS, HANDBOOKS, SPACE ENVIRONMENTS, RADIATION MEASURING INSTRUMENTS (U)
IDENTIFIERS: TRANSIENT RADIATION EFFECTS(ELECTRONICS) (M)

A BIBLIOGRAPHY OF 73 ABSTRACTS IS GIVEN ON THE EFFECTS OF RADIATION ON METALLIC, CERAMIC, ORGANIC, POLYMERIC, AND INORGANIC MATERIALS; ELECTRONIC MATERIALS, COMPONENTS, AND DEVICES; TEST FACILITIES; SPACE ENVIRONMENT AND EFFECTS ON MATERIALS; AND EXPERIMENTAL DEVICES AND TECHNIQUES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 602 164
BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS INFORMATION CENTER

MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II, FOR ACCESSION LISTS FROM OCTOBER 1, 1963 TO JUNE 30, 1964. (U)

JUL 64 16P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*INDEXES, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, MATERIALS), SUBJECT INDEXING, ABSTRACTS, NUCLEAR PARTICLES, DOSIMETERS, SPACE ENVIRONMENTS, ENVIRONMENT (U)

THE INVERTED CONCEPT-COORDINATE INDEX IS A REFERENCE FOR THE MONTHLY ACCESSION LIST (AD-602 163). THE INDEX IS SUBDIVIDED INTO SECTIONS. THE FIRST, RADIATION ENVIRONMENT, INCLUDES DOSIMETRY AND ENERGY ASPECTS OF ALL ELECTROMAGNETIC AND PARTICULATE RADIATION SOURCES, WITH THE EXCEPTION OF SPACE RADIATION. SECTION TWO DEALS WITH MATERIALS, PROPERTIES, SECONDARY ENVIRONMENT (INCLUDING SPACE ENVIRONMENTS), DEVICES, AND ALL OTHER SUBJECT CONCEPTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 602 600
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH.O

MECHANISM OF DIRECT ACTION OF RADIATION ON PER HLORIC U.C. ACID, (U)

JAN 64 12P BUGAENKO,L. T. ;
REPT. NO. FTD-MT-63-194

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MO O. VSESOYUZNOE SOVESHCHANIE PO RADIATSIONNOI KHIMI' (ALL-UNION CONFERENCE ON RADIATION CHEMISTRY) (NO. 2) MOSCOW 1960 . TRUDY, MOSCOW, 1962, P. 144-148.

DESCRIPTORS: (*RADIATION CHEMISTRY, PERCHLORIC ID), (*PERCHLORIC ACID, RADIATION CHEMISTRY), PERCHLORATES, PERCHLORYL RADICALS, REDUCTION (CHEMISTRY), X-RAYS, IONS, IRON, ETHANOLS, ACETONES, REACTION KINETICS, US(U)

RESULTS ARE GIVEN OF STUDIES ON THE EFFECTS OF BIVALENT FE, ETHANOL, AND ACETONE ON THE REDUCTION OF PERCHLORATE IONS IN THE PRESENCE OF X-RADIATION. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 603 605
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO

RADIOLYSIS OF PROPANE AT LOW CONVERSION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
AUG 64 66P BLOCKER, NORMAN KEITH ;
MONITOR: AFIT , GNE/PHYS/64 2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), HYDROCARBONS, PURIFICATION, DECOMPOSITION, CHROMATOGRAPHIC ANALYSIS, ALKENES, SYNTHESIS (CHEMISTRY), PARTICLE ACCELERATORS (U)

LOW CONVERSION STUDIES OF THE RADIOLYSIS OF PROPANE WERE PERFORMED BY THE USE OF A TECHNIQUE WHICH WAS DEVELOPED TO SATISFY THE STRINGENT REQUIREMENTS OF PURITY AND TRACE ANALYSIS CAPABILITY. THE CALCULATED G VALUE FOR ETHANE IN THE LOW CONVERSION REGION WAS 1.95. ALL OTHER PRODUCT YIELDS WERE DETERMINED RELATIVE TO THIS VALUE. SIGNIFICANT INCREASES IN YIELDS FOR PROPYLENE AND ETHYLENE WERE OBSERVED AS THE DEGREE OF CONVERSION WAS DECREASED FROM 2.6 TO 0.0045 PER CENT. THESE INCREASES WERE ATTRIBUTED TO THE ABSENCE OF INTERNAL SCAVENGING REACTIONS INVOLVING HYDROGEN ATOM ATTACK ON THESE PRODUCTS. A DECREASE IN THE YIELD OF 2,3 DIMETHYLBUTANE WAS ACCOMPANIED BY AN INCREASE IN THE YIELDS OF METHANE AND ETHANE AS THE CONVERSION WAS INCREASED FROM 0.05 TO 1.00 PER CENT. IT WAS CONCLUDED THAT THE INITIAL YIELDS FOR THE RADIOLYSIS PRODUCTS WERE REPRESENTED BY THE PRODUCT YIELDS AT THE LOWEST DEGREE OF CONVERSION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 605 430
ARMY ELECTRONICS LABS FORT MONMOUTH N J

EFFECTS OF IONIZING RADIATION ON PYRIDINE, (U)

JUL 64 8P PEARCE,CAROL K. ;
REPT. NO. TR-2485
PROJ: DA-1-A-010501-B-010
TASK: 1-A-010501-B-01026

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PYRIDINES, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, PYRIDINES), LIQUIDS, DECOMPOSITION, POLYMERIZATION, GASES, HYDROGEN, POLYMERS, ELECTRONIC EQUIPMENT (U)
IDENTIFIERS: ACETYLENES (U)

IRRADIATION OF LIQUID PYRIDINE WAS FOUND TO PRODUCE POLYPYRIDINES, AND HYDROGEN AND ACETYLENE GASES. A MECHANISM IS PRESENTED TO EXPLAIN THE PRODUCTS AND YIELDS OBSERVED. SOME CONCLUSIONS RELATED TO THE USE OF PYRIDINE COMPOUNDS FOR ELECTRONIC DEVICES ARE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 605 457
JOHNSTON (WILLIAM H) LABS INC BALTIMORE MD

BASIC STUDIES IN QUANTUM AND RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: REPT. FOR DEC 61-JUN 64,
JUN 64 129P VESTAL,MARVIN ;KRAUSE,M ;
JOHNSTON,WM. H. ;
CONTRACT: AF33 616 7678
PROJ: AF-7360
TASK: 736003
MONITOR: AFML TDR64 169

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, QUANTUM THEORY), (*QUANTUM THEORY, RADIATION CHEMISTRY), GASIONIZATION, PHOTONS, ELECTRONS, X-RAYS, ATOMIC ORBITALS, MASS SPECTROSCOPY, ALIPHATIC COMPOUNDS, ALCOHOLS, AMINES, SILANES, HYDROGEN COMPOUNDS, SULFIDES, HYDROCHLORIC ACID, ARGON, METHANE, AMMONICA, WATER VAPOR, NEON, THIOLS, HALOGENATED HYDROCARBONS, KRYPTON CARBON TETRACHLORIDE, XENON, MERCURY, BUTANES, OXYGEN, NITROGEN (U)

THE PRIMARY INTERACTIONS OF HIGH ENERGY PHOTONS AND ELECTRONS WITH MATTER IN THE GAS PHASE WERE STUDIED. THE EXPERIMENTAL STUDIES INCLUDED MEASUREMENTS OF THE MASS/CHARGE SPECTRA PRODUCED BOTH BY X-RAY IONIZATION AND BY HIGH ENERGY ELECTRON IONIZATION, AS WELL AS SECONDARY ELECTRON ENERGY MEASUREMENTS FOR BOTH X-RAY AND ELECTRON IONIZATION. THE MOLECULES STUDIED WERE THE FOLLOWING: PROPANE, ETHANOL, ETHYLAMINE, SILANE, HYDROGEN SULFIDE, HYDROGEN CHLORIDE, ARGON, METHANE, AMMONIA, WATER, NEON, ETHYL SILANE, ETHANETHIOL, ETHYL CHLORIDE, METHYL CHLORIDE, METHYL BROMIDE, ETHYL BROMIDE, HYDROGEN BROMIDE, KRYPTON, METHYL IODIDE, ETHYL IODIDE, CARBON TETRACHLORIDE, XENON, MERCURY, DIMETHYLAMINE, 1, 3-BUTADIENE, N-BUTANE, 2BUTYNE, OXYGEN AND NITROGEN. THE DATA OBTAINED IN THESE INVESTIGATIONS ARE THE FIRST COMPREHENSIVE MEASUREMENTS OF INNER SHELL IONIZATION BY X-RAYS IN WHICH THE RESULTING MASS/CHARGE SPECTRA WERE MEASURED IN A MASS SPECTROMETER. THE THEORETICAL INTERPRETATION AND A SEMIEMPIRICAL CORRELATION OF THE EXPERIMENTAL DATA ARE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 609 440
AMERICAN OIL CO WHITING IND

THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS. (U)

DESCRIPTIVE NOTE: REPT. FOR 30 NOV 62-31 JUL 64,
NOV 64 30P RONDEAU,R. E. ;HARRAH,L. A.
;NEVITT,T. D. ;BARBER,H. H.,JR.;SCHAFFER,R.
;
CONTRACT: AF33 616 8247
PROJ: AF-7367
TASK: 736701
MONITOR: AFML TR-64-353

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), DECOMPOSITION, POLYMERIZATION, FREE RADICALS, AROMATIC COMPOUNDS, NITRILES, CHROMATOGRAPHIC ANALYSIS (U)
IDENTIFIERS: ACETYLENE/ETHYL, CROTONYLENE, HEXYNES, PROPYNE (U)

THE DISTRIBUTION OF PRODUCTS FROM THE RADIOLYSIS OF BUTYNE-2, PROPYNE, PENTYNE-2, HEXYNE-3 AND BUTYNE-1 ARE GIVEN. DIMERS, TRIMERS AND TETRAMERS, OF EMPIRICAL FORMULAE CNH2N, CNH2N-2 AND CNH2N-4, ARE FORMED IN THE FOLLOWING RELATIVE CONCENTRATION: (DIMERS) >> (TRIMERS) >> (TETRAMERS). A GENERAL MECHANISM ON THE BASIS OF FREE RADICAL REACTIONS IS INVOKED TO ACCOUNT FOR THIS DISTRIBUTION. IN ADDITION, AROMATIC PRODUCTS ARE ALSO FORMED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 610 038
AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 4, L OCT-31 DEC 64,
JAN 65 15P MORTON,MAURICE ;
CONTRACT: AF04 611 9694
PROJ: 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*POLYMERIZATION, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, POLYMERIZATION), (*LOW TEMPERATURE, POLYMERIZATION), ACRYLONITRILE POLYMERS, VINYL PLASTICS, FLUORIDES, CHLORIDES, SOLVENTS, PURIFICATION, GAMMA RAYS, HALOCARBON PLASTICS (U)
IDENTIFIERS: ACETONE/HEXAFLUORO, CHLORAL, CYANIDE/ ALLYL (U)

THE REPORT CONTAINS RESULTS ON THE POLYMERIZATION OR ATTEMPTED POLYMERIZATION OF THE FOLLOWING MONOMERS BY GAMMA RADIATION AT REDUCED TEMPERATURES: ACRYLONITRILE, VINYL FLUORIDE, VINYL CHLORIDE, ALLYL CYANIDE, CHLORAL, AND HEXAFLUOROACETONE. SINCE THE LAST REPORTING PERIOD, WORK HAS CONTINUED TO DETERMINE THE CAUSES OF THE ERRATIC RATES OBTAINED IN THE RADIATION-INDUCED POLYMERIZATION OF ACRYLONITRILE AT -74C AND 720,000 RADS PER HOUR. IN ADDITION, THE GAMMA RAY INITIATED POLYMERIZATION OF VINYLIDENE FLUORIDE, VINYL FLUORIDE, VINYL CHLORIDE AND 3-BUTENE NITRILE (ALLYL CYANIDE) AT -72 TO -74C HAS BEEN EXAMINED. NEW WORK WAS ALSO STARTED ON THE RADIATIONINITIATED POLYMERIZATION OF CARBONYL COMPOUNDS. THE TWO MONOMERS THUR FAR STUDIED WERE CHLORAL AND HEXAFLUORO-ACETONE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 610 557
ROCK ISLAND ARSENAL ILL

RADIATION AND OZONE INITIATED GRAFT COPOLYMERIZATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
OCT 64 16P MCGARVEY,J. W. ;
REPT. NO. RIA-64-3009
PROJ: 1C0 24401A110

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ELASTOMERS, SYNTHESIS (CHEMISTRY)), (*COPOLYMERIZATION, CATALYSIS), (*RADIATION CHEMISTRY, COPOLYMERIZATION), (*OZONE, COPOLYMERIZATION), VULCANIZATES, VINYL PLASTICS, BUTYL RUBBER, ACRYLONITRILE POLYMERS, SILICONE PLASTICS, VULCANIZAT(U)
IDENTIFIERS: DICHLORO ETHYLENES, GRAFT POLYMERS (U)

RADIATION AND OZONE INITIATED GRAFT COPOLYMERIZATION REACTIONS WERE INVESTIGATED FOR THE SYNTHESIS OF NEW TECHNOLOGICALLY USEFUL ELASTOMERS. SIGNIFICANT GRAFTING WAS OBSERVED FOR MANY OF THE VARIOUS COMBINATIONS OF MONOMERS AND POLYMERS INVESTIGATED. RADIATION INITIATED VINYLIDENE CHLORIDE-SBR AND OZONE INITIATED ACRYLONITRILESBR GRAFT COPOLYMERS ARE OF PARTICULAR INTEREST SINCE THEY EXHIBIT IMPROVED OIL RESISTANCE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 611 561
GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY

EFFECT OF ENVIRONMENTAL HYDROGEN PRESSURE ON THE HYDROGEN YIELD FROM XIRRADIATED POLYETHYLENES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. FOR 1 OCT 63-30 SEP 64,
JAN 65 36P HILL,O. H. ;LIGHTFOOT,R. P. ;
REPT. NO. FZK-203
CONTRACT: AF29 601 6213
PROJ: AF-6773
TASK: 677302
MONITOR: AFWL TR-64-150

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SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC SALE.

DESCRIPTORS: (*POLYETHYLENE PLASTICS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, POLYETHYLENE PLASTICS), X-RAYS, DECOMPOSITION, GASES, HYDROGEN, REACTION KINETICS, TEST EQUIPMENT, TEST METHODS, PRESSURE, MONITORS (U)

AN EXPERIMENTAL ASSEMBLY INCORPORATING A CAPACITANCETYPE, DIFFERENTIAL PRESSURE TRANSDUCER, WHICH PROVIDES RESOLUTIONS OF 0.3 MICRON AT PRESSURES EXTENDING TO 30 MM, HAS BEEN EMPLOYED TO MONITOR THE EFFECT OF HYDROGEN ENVIRONMENTAL PRESSURE ON THE HYDROGEN YIELD FROM XIRRADIATED POLYETHYLENES. CONTRARY TO THE OBSERVATIONS OF PREVIOUS RESEARCHERS, THE HYDROGEN YIELD IS FOUND TO BE INDEPENDENT OF HYDROGEN ENVIRONMENTAL PRESSURES EXTENDING UP TO AT LEAST 30 MM HG. IT IS DEMONSTRATED THAT NEGLECTING THE TEMPERATURE AND DENSITY GRADIENTS INHERENT IN CLOSED-VOLUME IRRADIATION ASSEMBLIES EMPLOYING CRYOGENIC TRAPS TO SEPARATE LIBERATED GASES INTO CONDENSABLE AND NONCONDENSABLE FRACTIONS MAY LEAD TO ERRONEOUS CONCLUSIONS WITH RESPECT TO GAS YIELDS ARISING FROM THE IRRADIATION OF MATERIALS. TOTAL VOLATILE G-VALUES OF 3.6, 3.8, AND 4.0 MOLECULES PER 100 EV WERE OBTAINED FOR MARLEX 6002, DOW ZIEGLER (Q 917.5), AND DUPONT A-1410 POLYETHYLENES, RESPECTIVELY, WITH HYDROGEN CONTRIBUTIONS OF APPROXIMATELY 98 MOLE PERCENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 611 575
GENERAL DYNAMICS/FORT WORTH TEX

X-RADIATION-INDUCED UNSATURATION CHANGES IN MARLEX 6002 POLYETHYLENE. (U)

DESCRIPTIVE NOTE: REPT. FOR 1 OCT 63-30 SEP 64, JAN 65 48P HILL,O. H. ;ALBRECHT,T. W. ;
REPT. NO. FZK-204
CONTRACT: AF29 601 6213
PROJ: AF-6773
TASK: 677302
MONITOR: AFWL TR-64-147

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*POLYETHYLENE PLASTICS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, POLYETHYLENE PLASTICS), DECOMPOSITION, GASES, MONITORS, INFRARED SPECTROPHOTOMETERS, INFRARED SPECTROSCOPY, REACTION KINETICS, HYDROGEN, PRESSURE (U)

AN IRRADIATION-DEWAR ASSEMBLY WAS DESIGNED FOR USE WITH AN INFRARED SPECTROPHOTOMETER SO THAT SELECTED ORGANICS COULD BE INTERMITTENTLY MONITORED DURING X-IRRADIATION WITH MAXIMUM ENVIRONMENTAL AND TEMPERATURE INTEGRITY OF THE SAMPLE. THIS ASSEMBLY WAS EMPLOYED TO STUDY THE TEMPERATURE DEPENDENCE OF THE RATES OF CHANGE OF UNSATURATION IN MARLEX 6002 POLYETHYLENE. THE INITIAL RATE OF RADIATION-INDUCED TRANS-VINYLENE FORMATION IN MARLEX 6002 POLYETHYLENE IS FOUND TO BE 2.0=0.3 BONDS PER 100 EV AND INDEPENDENT OF TEMPERATURE OVER THE RANGE OF FROM 105 TO 300K, WHILE VINYL DECAY EXTRAPOLATED TO ZERO RADIATION DOSE OVER THE SAME RANGE SATISFIES G(-VI) = 5.8 EXP (341 (1/300 - 1/T)), WITH G(-VI) REPRESENTING THE NUMBER OF VINYL BONDS DISAPPEARING PER 100 EV ABSORBED AT ABSOLUTE TEMPERATURE T(K). THE PROCESS OF TRANSVINYLENE ELIMINATION HAS BEEN OBSERVED QUALITATIVELY TO BE TEMPERATURE-DEPENDENT OVER THIS TEMPERATURE RANGE. A 1-ATM PRESSURE OF HYDROGEN DOES NOT CHANGE UNSATURATION RATES. THE TECHNIQUES EMPLOYED HAVE CERTAIN ADVANTAGES IN FUNDAMENTAL RADIATION CHEMISTRY STUDIES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 611 779
PENNSYLVANIA STATE UNIV UNIVERSITY PARK

AN EPR INVESTIGATION OF RADIATION PROTECTION BY AROMATIC ADDITIVES IN SYNTHETIC POLYMERS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
DEC 64 75P BANASZAK,JEROME J. ;
CONTRACT: AF33 608 954

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PLASTICS, ADDITIVES), (*ACRYLIC RESINS, DAMAGE), (*POLYMERS, DAMAGE), (*RADIATION CHEMISTRY, POLYMERS), (*NUCLEAR MAGNETIC RESONANCE, POLYMERS), X-RAYS, GAMMA RAYS, FREE RADICALS, ELECTRONS, NUCLEAR SPINS, PARAMAGNETIC RESONANCE, MICROWAVE SPECTROSCOPY, AROMATIC COMPOUNDS, SALICYLATES, BENZOATES, RESORCINOL, PHOSPHORIC ACIDS, XYLENES, (U)XYLENES (U)

THE RESEARCH IS A STUDY OF THE PROTECTIVE EFFECTS AGAINST IONIZING RADIATION THAT AROMATIC COMPOUNDS PROVIDE WHEN ADDED TO A SYNTHETIC POLYMER IN VARIOUS PROPORTIONS. SINCE RADIATION DAMAGE IN HIGH POLYMER COMPOUNDS IS USUALLY ACCOMPANIED BY THE PRODUCTION OF FREE RADICALS IN THE MATERIAL, ELECTRON PARAMAGNETIC RESONANCE (EPR) TECHNIQUES WERE UTILIZED TO MEASURE THE EXTENT OF THE FREE RADICAL CONCENTRATION. COMPARATIVE MEASUREMENTS WERE MADE OF THE RADIATION-PROTECTIVE EFFECTS OF DIFFERENT AROMATIC ADDITIVES ON POLYMETHYL METHACRYLATE. DATA OBTAINED FROM THE EPR SPECTRA WAS CORRELATED WITH SOME OF THE THEORIES CURRENTLY ADVANCED RELATING FREE RADICAL FORMATION, DEGRADATION AND CROSSLINKING DURING POLYMER IRRADIATION. DEGRADATION OR MULTIPLE CHAIN SCISSION, IS DEFINED AS THE BREAKING UP OF THE LONG MOLECULAR CHAINS IN A POLYMER INTO SMALLER UNITS, WHEREAS CROSSLINKING IS USUALLY ASSOCIATED WITH INCREASING THE NUMBER OF LATERAL LINKAGES BETWEEN POLYMER CHAINS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 613 305
CALIFORNIA UNIV LOS ANGELES

CHEMISTRY OF POSITIVE IONS. I. GENERAL THEORY PARTICULARLY FOR THE RADIATION INDUCED CROSS LINKAGE OF POLYMERS AND POLYMERIZATION OF SATURATED HYDROCARBONS. (U)

61 30P LIBBY,W. F. ;
CONTRACT: AF49 638 901
MONITOR: AFOSR , 563

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, IONS), (*IONS, RADIATION CHEMISTRY), (*POLYMERS, RADIATION CHEMISTRY), (*HYDROCARBONS, POLYMERIZATION), (*POLYETHYLENE PLASTICS, RADIATION CHEMISTRY), FREE RADICALS, THEORY, ALIPHATIC COMPOUNDS, REACTION KINETICS, IONIZATION POTENTIALS, THERMOCHEMISTRY, DECOMPOSITION, HEAT OF ACTIVATION, CHEMICAL BONDS, PHASE STUDIES (U)

THE CHEMICAL PROPERTIES OF POSITIVE IONS ARE CONSIDERED TO BE ANALOGOUS TO THOSE OF THE CORRESPONDING NEUTRAL ATOM OR MOLECULE EXCEPT THAT THE CHARGE STRENGTHENS BONDS AND PROVIDES THE LONG RANGED ATTRACTIVE POLARIZATION FORCE WHICH CAUSES THE REACTION CROSS SECTIONS TO BE VERY LARGE. FOR ORGANIC IONS DEHYDROGENATION TO FORM CARBONIUM IONS OCCURS FREQUENTLY SO IN ADDITION TO THE PARENT ION RADICAL WITH ITS GREAT REACTIVITY AS A TYPE OF SUPER FLUORINE ATOM THE CARBONIUM IONS WITH THEIR EXTREMELY ACIDIC (ELECTROPHILIC) PROPERTIES CAUSE A WHOLLY DIFFERENT SET OF REACTIONS ANALOGOUS TO THOSE OF CARBENE AND LEADING TO THE PREDICTION OF RADIATION INDUCED POLYMERIZATION OF SATURATED ALIPHATIC HYDROCARBONS. BOTH ION RADICALS AND CARBONIUM IONS CAN PLAY IMPORTANT ROLES IN THE RADIATION INDUCED CROSS LINKAGE OF POLYETHYLENE AND OTHER POLYMERS. IT IS PREDICTED THAT THE EFFECT OF PHASE WILL BE VERY IMPORTANT IN RADIATION CHEMISTRY BECAUSE THE CAGE EFFECT OF THE SURROUNDING CLOSE PACKED MOLECULES IN THE LIQUID AND SOLID PHASE AS CONTRASTED WITH THE GAS PHASE WILL CAUSE THE FRAGMENTATION OF THE PARENT IONS WHICH IS SO MARKED IN THE GAS PHASE TO BE REVERSED TO A CONSIDERABLE EXTENT AND PROMOTE THE FORMATION OF LARGE MOLECULES, PARTICULARLY POLYMERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 613 529
AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 5, 1 JAN-31 MAR 65,
APR 65 30P MORTON,MAURICE ;
CONTRACT: AF04 611 9694
PROJ: 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-610 038.

DESCRIPTORS: (*POLYMERIZATION, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, POLYMERIZATION), (*THERMOCHEMISTRY, POLYMERIZATION), LOW TEMPERATURE, ACRYLONITRILE POLYMERS, VINYL PLASTICS, HALOCARBON PLASTICS, ALDEHYDES, KETONES, NITRILES, COPOLYMERIZATION, GAMMA RAYS, BIBLIOGRAPHIES (U)
IDENTIFIERS: PROPYLENE HEXAFLUORIDE (U)

THE REPORT CONTAINS RESULTS ON THE POLYMERIZATION OR ATTEMPTED POLYMERIZATION OF THE FOLLOWING MONOMERS BY GAMMA RADIATION (7.6 RADS/HR.) AT REDUCED TEMPERATURES: ACRYLONITRILE, HEXAFLUOROPROPYLENE, FUMARONITRILE, HEXAFLUOROACETONE, TRIFLUOROACETALDEHYDE, PERFLUOROOCTANAL, AND PENTAFLUOROPROPIONALDEHYDE. A COMPREHENSIVE BIBLIOGRAPHY ON THE GAMMA IRRADIATION OF POTENTIAL MONOMERS WAS ALMOST COMPLETED, AND A PRELIMINARY LISTING IS INCLUDED. IN ADDITION, A DIFFERENTIAL THERMAL ANALYSIS ASSEMBLY WAS CONSTRUCTED FOR USE DURING POLYMERIZATION BY GAMMA RADIATION OF ACRYLONITRILE. THE RESULTS QUALITATIVELY INDICATE THAT POLYMERIZATION OCCURS ONLY IN THE TEMPERATURE VICINITY OF A PHASE TRANSITION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 614 731
RESEARCH TRIANGLE INST DURHAM N C

PREPARATION AND CHARACTERIZATION OF SOME CELLULOSE GRAFT COPOLYMERS. PART III. THE ROLE OF CONCURRENT DEGRADATION DURING RADIATION GRAFTING, (U)

JUN 64 11P WELLONS, J. D. ; STANNETT, V. ;
MONITOR: AROD , 3630:8

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF POLYMER SCIENCE: PART A V3 P847-57 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*CELLULOSE ACETATES, RADIATION CHEMISTRY), (*COPOLYMERIZATION, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, COPOLYMERIZATION), DECOMPOSITION, ORGANIC SOLVENTS, PYRIDINES, AROMATIC COMPOUNDS, FILMS, STYRENE PLASTICS, POLYETHYLENE PLASTICS (U)
IDENTIFIERS: GRAFT POLYMERS (U)

THE RADIATION DEGRADATION OF CELLULOSE ACETATE WAS STUDIED BOTH IN THE DRY STATE AND IN SOLUTION. THE RATE OF DEGRADATION WAS GREATER IN THE SOLID STATE AND WAS UNAFFECTED BY OXYGEN. CONJUGATED SOLVENTS SUCH AS PYRIDINE, TOLUENE, AND ALPHA-METHYLSTYRENE WERE SHOWN TO EXERT CONSIDERABLE PROTECTION AGAINST THE RADIATION DEGRADATION OF CELLULOSE ACETATE WHEN IN SOLUTION OR AS SWOLLEN FILMS. ALPHAMETHYLSTYRENE WAS USED AS A MODEL FOR STYRENE TO STUDY THE AMOUNT OF DEGRADATION ACCOMPANYING THE GRAFTING PROCESS. MATCHING EXPERIMENTS WERE CARRIED OUT BY USING BOTH THE MUTUAL AND PREIRRADIATION METHODS OF GRAFTING. CONSIDERABLY GREATER CHAIN CLEAVAGE WAS FOUND TO ACCOMPANY THE GRAFTING IN THE PREIRRADIATION CASE. WITH BOTH METHODS THE NUMBER OF CHAIN CLEAVAGES WAS MEASURED WHEN ALPHA-METHYLSTYRENE WAS PRESENT IN THE 'GRAFTING' SOLUTION AND THE NUMBER OF GRAFTED SIDE CHAINS WHEN STYRENE WAS USED. IT WAS SHOWN THAT AT LEAST TWICE AS MANY GRAFTED CHAINS AS CLEAVAGES OCCUR WITH THE MUTUAL TECHNIQUE, BUT IN THE CASE OF PREIRRADIATION THE NUMBER OF CLEAVAGES IS COMPARABLE TO THE NUMBER OF GRAFTED CHAINS. IN GENERAL, IT CAN BE SAID THAT IN EVERY CASE AT LEAST 50% OF THE GRAFT COPOLYMERS ARE SIDE-CHAIN GRAFTS; THIS FIGURE IS PROBABLY CONSIDERABLY HIGHER IN THE CASE OF THE MUTUAL RADIATION PREPARATIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 614 984
BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS INFORMATION CENTER

MONTHLY ACCESSION LIST COORDINATE INDEX, PART II. (U)

DESCRIPTIVE NOTE: REPT. FOR 1 OCT 64-30 APR 65, MAY 65 13P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF DDC. COPY IS NOT AVAILABLE FOR PUBLIC SALE.

DESCRIPTORS: (*DAMAGE, INDEXES), (*INDEXES, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, MATERIALS), (*ELECTROMAGNETIC RADIATION, DEGRADATION), SUBJECT INDEXING, ALPHA PARTICLES, DEUTERONS, ELECTRONS, NEUTRONS, IONS, PROTONS, GAMMA RAYS, X RAYS, PHOTONS, ELECTROMAGNETIC PULSES, ULTRAVIOLET RADIATION, (U)ULTRAVIOLET RADIATION (U)

THE INVERTED CONCEPT-COORDINATE INDEX IS A REFERENCE FOR THE MONTHLY ACCESSION LIST (AD-614 985). THE INDEX IS SUBDIVIDED INTO SECTIONS. THE FIRST, RADIATION ENVIRONMENT, INCLUDES DOSIMETRY AND ENERGY ASPECTS OF ALL ELECTROMAGNETIC AND PARTICULATE RADIATION SOURCES, WITH THE EXCEPTION OF SPACE RADIATION. SECTION TWO DEALS WITH MATEPIALS, PROPERTIES, SECONDARY ENVIRONMENT (INCLUDING SPACE ENVIRONMENTS), DEVICES, AND ALL OTHER SUBJECT CONCEPTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 615 602
NAVAL RESEARCH LAB WASHINGTON D C

CHEMONUCLEAR SYNTHESIS OF NITROGENFLUORINE COMPOUNDS. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,
APR 65 14P HAZLETT,R. N. ;
REPT. NO. NRL-6239
PROJ: RR010 01 44 5851

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ROCKET PROPELLANTS, SYNTHESIS (CHEMISTRY)), (*NITROGEN COMPOUNDS, FLUORIDES), (*FLUORIDES, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ROCKET PROPELLANTS), URANIUM COMPOUNDS, FISSION PRODUCTS, NITROGEN, FLUORINE, THERMAL NEUTRONS, AZINES (U)
IDENTIFIERS: NITROGEN FLUORIDES, URANIUM(VI) FLUORIDE (U)

MIXTURES OF NITROGEN AND FLUORINE CONTAINING URANIUM-235 AS URANIUM HEXAFLUORIDE WERE EXPOSED TO THE RADIATION FIELD OF A NUCLEAR REACTOR. THE FISSION FRAGMENTS FORMED BY REACTION OF U(235) WITH THE THERMAL NEUTRON COMPONENT OF THE REACTOR RADIATION CAUSED THE FORMATION OF NITROGEN FLUORIDES. THOSE IDENTIFIED WERE NITROGEN TRIFLUORIDE, CISDIFLUORODIAZINE, AND TRANS-DIFLUORODIAZINE. NITROGEN TRIFLUORIDE IS THE MAJOR PRODUCT, AND THE AMOUNT FORMED IS DEPENDENT UPON THE TOTAL ENERGY DEPOSIED. THE OTHER TWO PRODUCTS ARE IN EQUILIBRIUM WITH EACH OTHER, AND THE AMOUNT FORMED DECREASES AS THE RADIATION INTENSITY INCREASES. THE TOTAL G VALUE FOR COMPOUND FORMATION IS LESS THAN 1 MOLECULE PER 100 ELECTRON VOLTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 615 704
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C

BEHAVIOR OF UNSATURATED FATTY ACIDS IN THE THIOBARBITURIC ACID TEST AFTER RADIOLYSIS. (U)

SEP 64 15P SASLAW,L. D. ;WARAVDEKAR,V. S. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN RADIATION RESEARCH V24 N3 P375-89 MAR 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*FATTY ACIDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, FATTY ACIDS), BARBITURATES, ACIDS, CHEMICAL ANALYSIS, LINOLENIC ACID, LINOLEIC ACID, ULTRAVIOLET RADIATION, GAMMA RAYS, CHEMICAL INDICATORS, BIOCHEMISTRY (U)
IDENTIFIERS: OLEIC ACID (U)

IRRADIATION OF LINOLENIC ACID AND ARACHIDONIC ACID RESULTS IN PRODUCTION OF SEVERAL CHROMATOGRAPHICALLY DISTINGUISHABLE THIOBARBITURIC ACID (TBA)-ACTIVE COMPOUNDS. THE ULTRAVIOLET RADIATION-INDUCED OXIDATION OF THE FATTY ACIDS IS ALSO CHARACTERIZED BY INCREASED ABSORPTION AT 225 MILLIMICRONS AND A POSITIVE BENZIDINE TEST. CHROMATOGRAPHICALLY DIFFERENT TBA-ACTIVE PRODUCTS WERE OBTAINED, DEPENDING ON THE RADIATION AND THE SUBSTRATE EMPLOYED. DESPITE THE SIMILARITY OF CHROMOGEN SOLUTIONS OBTAINED FROM THE TBA-ACTIVE PRODUCTS TO THAT OBTAINED FROM MALONALDEHYDE, THE PRESENCE OF MALONALDEHYDE AMONG THE PRODUCTS AFTER EITHER PROCESS OF IRRADIATION WAS NOT EVIDENT. AFTER RESOLUTION OF THE TBA-ACTIVE PRODUCTS ON THIN-LAYER CHROMATOPLATES, THE TBA-ACTIVE SITES WERE OBSERVED TO REACT WITH BENZIDINE BUT DID NOT LIBERATE IODINE FROM POTASSIUM IODIDE. IN EACH IRRADIATION PROCESS, THE PRODUCTION OF TAB-ACTIVE COMPOUNDS WAS ACCOMPANIED BY PEROXIDE FORMATION. HOWEVER, THE TBA-ACTIVE COMPOUNDS ARE NOT OF A PEROXIDE NATURE. INASMUCH AS THE TBAACTIVE COMPOUNDS REACT WITH STANDARD REAGENTS FOR DETECTION OF THE CARBONYL FUNCTION, THE TBA TEST MUST BE REGARDED AS A TEST FOR UNIDENTIFIED CARBONYL COMPOUNDS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 615 983
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION POLYMERIZATION ON N=HEPTENE IN PRESENCE OF TICL4, (U)

MAY 65 11P KOLBANOVSKII,YU. A. ;POLAK,L. S. ;SHLIKHTER,E. B. ;
REPT. NO. FTD-TT-65-31
MONITOR: TT , 65-62409

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF NEFTEKHIMIYA (USSR) V3 N2 P222-6 1963. AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION.

DESCRIPTORS: (*ALKENES, POLYMERIZATION), (*RADIATION CHEMISTRY, ALKENES), TITANIUM COMPOUNDS, CHLORIDES, CATALYSTS, USSR (U)
IDENTIFIERS: TITANIUM(IV) CHLORIDE (U)

RADIATION POLYMERIZATION OF N-HEPTENE-1 WAS INVESTIGATED IN PRESENCE OF TICL4, AS WELL AS THE EFFECT OF DOSAGE, DOSAGE POWER AND RADIATION TEMPERATURE, AMOUNT OF CATALYST AND DILUTION ON THE YIELD OF THE POLYMER. IT WAS SHOWN, THAT IN DILUTED SOLUTIONS AND AT LOWER TEMPERATURES, OPTIMUM CONDITIONS FOR POLYMERIZATION WITH TICL4 ARE CREATED. WHEN CALCULATING ENERGY ABSORBED BY MONOMER ONLY, THE VALUES OF RADIATION-CHEMICAL YIELD CONSTITUTE APPROX. 50 MOL/100 EV. IT WAS ESTABLISHED THAT THE POLYMER YIELD DEPENDS UPON DOSAGE POWER IN DEGREE 0.8. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 616 958
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

RARE GAS SENSITIZED RADIOLYSIS OF ACETYLENE, (U)

SEP 64 9P FUTRELL,J. H. ;SIECK,L. W. ;
REPT. NO. ARL 65-101

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF PHYSICAL CHEMISTRY V69 P892-900 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS). PRESENTED AT THE ANNUAL MEETING OF THE RADIATION RESEARCH SOCIETY (12TH) MIAMI BEACH, FLA., MAY 17-20, 1964.

DESCRIPTORS: (*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, POLYMERIZATION), (*RARE GASES, ALIPHATIC COMPOUNDS), POLYMERS, NEON, IONIZATION (U)
IDENTIFIERS: ACETYLENES (U)

THE GAS PHASE RADIOLYSIS OF ACETYLENE HAS BEEN INVESTIGATED IN THE PRESENCE AND ABSENCE OF VARIOUS SENSITIZERS AT VARIOUS DOSE RATES. THE POLYMERIZATION REACTIONS HAVE BEEN CORRELATED WITH HIGH-PRESSURE, MASS SPECTROMETRIC STUDIES OF MIXTURES WITH RARE GASES, WITH THE CONCLUSION THAT THE PRECURSORS FOR POLYMER PROPAGATION DO NOT DEPEND UPON CHARGE EXCHANGE (IONIZATION OF ACETYLENE). A QUANTITATIVE INVESTIGATION OF BENZENE PRODUCTION AND SENSITIZATION INDICATES THAT NEON IS UNIQUE AMONG THE NOBLE GASES IN THAT IT ALONE ENHANCES THE FORMATION. THE INITIAL INTERACTION, NE(+) + C2H2 TO C2H(+) + H + NE, OBSERVED MASS SPECTROMETRICALLY IS RESPONSIBLE. VARIOUS PHOTOLYSIS AND RADIOLYSIS EXPERIMENTS INVOLVING ARGONDEUTERIUM-ACETYLENE AND DEUTERIUM-ACETYLENE MIXTURES HAVE DEFINED THE MECHANISM FOR THE INCREASE IN G(C6H6) OBSERVED IN THIS WORK AND IN PREVIOUS STUDIES AT LOWER DOSE RATES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 617 025
MCMASTER UNIV HAMILTON (ONTARIO)

RADIATION-INDUCED GRAFT POLYMERIZATION OF STYRENE IN WOOD, (U)

64 15P RAMALINGAM,K. V. ;WEREZAK,G. N. ;HODGINS,J. W. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF POLYMER SCIENCE: PT C N2 P153-67 1963. (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*POLYMERIZATION, RADIATION CHEMISTRY), (*WOOD, PLASTICIZERS), (*PLASLICIZERS, COPOLYMERIZATION), (*RADIATION CHEMISTRY, POLYMERIZATION), STYRENE PLASTICS, CELLULOSE, GAMMA RAYS, IMPREGNATION, PHYSICAL PROPERTIES, PARAMAGNETIC RESONANCE, SPECTROSCOPY, FREE RADICALS, FEASIBILITY STUDIES (U)
IDENTIFIERS: GRAFT POLYMERIZATION (U)

GRAFTING OF POLYSTYRENE TO THE CELLULOSE IN RED PINE SAPWOOD HAS BEEN ACCOMPLISHED BY GAMMA IRRADIATION OF THE TERNARY SOLUTION OF STYRENE, METHANOL, AND WATER. THE RESULTING MATERIAL POSSESSES SUBSTANTIALLY ENHANCED BENDING STRENGTH AND DIMENSIONAL STABILITY. OPTIMUM CONDITIONS HAVE BEEN DETERMINED BY A FACTORIAL EXPERIMENTAL DESIGN. ELECTRON SPIN RESONANCE STUDIES HAVE REVEALED TWO DISTINCT TYPES OF LONG-LIVED FREE RADICALS, ONE OF WHICH IS THE SPECIFIC PRECURSOR FOR THE GRAFTING REACTION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 617 580
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

RADIOLYSIS OF CYCLOHEXANE. V. PURIFIED LIQUID CYCLOHEXANE AND SOLUTIONS OF ADDITIVES, (U)

FEB 64 9P HO,S. K. ;FREEMAN,G. R. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF PHYSICAL CHEMISTRY V68 N8 P2189-97 AUG 1964 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*CYCLOHEXANES, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, CYCLOHEXANES), GAMMA RAYS, CHEMICAL REACTIONS, HYDROGEN, CYCLOHEXANES, ALIPHATIC COMPOUNDS, HYDROCARBONS, FREE RADICALS, OXYGEN, QUINO(U)

THE INITIAL PRODUCT YIELDS (G VALUES) IN THE GAMMARADIOLYSIS OF HIGHLY PURIFIED LIQUID CYCLOHEXANE HAVE BEEN FOUND TO BE: HYDROGEN 5.6 = 0.1; CYCLOHEXENE 3.2 = 0.2; 1-HEXENE 0.40 = 0.05; N-HEXANE 0.08 = 0.02; METHYLCYCLOPENTANE 0.15 = 0.01; ETHYLCYCLOHEXANE APPROXIMATELY 0.04; DICYCLOHEXYL 1.76 = 0.05; CYCLOHEXYLHEXENE 0.12 = 0.02; UNIDENTIFIED C(12) APPROXIMATELY 0.05. CYCLOHEXYLCYCLOHEXENE WAS A SECONDARY PRODUCT. BOTH OXYGEN AND P-BENZOQUINONE REDUCED THE MAJOR LIQUID PRODUCT YIELDS TO THE SAME LIMITING VALUES: CYCLOHEXENE 1.5 = 0.1; 1-HEXENE 0.27 = 0.03; DICYCLOHEXYL 0.29 = 0.03. FROM THE REDUCTION IN THE YIELDS OF THESE PRODUCTS, AND ON THE ASSUMPTION THAT FREE RADICALS WERE BEING SCAVENGED BY THE ADDITIVES, A LOWER LIMIT OF 1.1 = 0.3 WAS OBTAINED FOR THE RATIO OF THE RATE CONSTANTS K(DISPROPORTIONATION)/ K(COMBINATION) FOR CYCLOHEXYL RADICALS IN LIQUID CYCLOHEXANE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 618 155
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

THE RADIOLYSIS OF PROPANE AT EXTREMELY LOW CONVERSIONS. (U)

SEP 64 7P SIECK,L. W. ;BLOCKER,N. K. ; FUTRELL,J. H. ;
REPT. NO. ARL-65-102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ANNUAL MEETING OF THE RADIATION RESEARCH SOCIETY (12TH), MIAMI BEACH, FLA. MAY 17-20, 1964. PUB. IN JOURNAL OF PHYSICAL CHEMISTRY V69 P888-92 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), VAPORS, DECOMPOSITION, DISPROPORTIONATION, REACTION KINETICS, IONS, FREE RADICALS (U)

THE GAS PHASE RADIOLYSIS OF PROPANE WAS INVESTIGATED AT EXTREMELY LOW CONVERSIONS IN ORDER TO DETERMINE INITIAL G VALUES. YIELDS OF UNSATURATED PRODUCTS ARE FOUND TO BE SIGNIFICANTLY HIGHER THAN THOSE OBTAINED IN THE PRESENCE OF ADDED SCAVENGERS, AND THE DIFFERENCES CAN BE CORRELATED WITH RADICAL-DISPROPORTIONATION REACTIONS. DOSE DEPENDENCE IS DISCUSSED IN SOME DETAIL AND POSSIBLE EXPLANATIONS FOR THE VARIATIONS IN YIELD ARE OFFERED. ALTHOUGH NO DETAILED MECHANISM IS ADVANCED, THE QUANTITATIVE YIELD DATA UPON WHICH THE MECHANISM MUST REST ARE PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 621 022
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

RADIOLYSIS OF SOLID ETHYL IODIDE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
AUG 65 71P HERMANN, GORDON L. ;
REPT. NO. GNE/PH/65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, HALOGENATED HYDROCARBONS), (*HALOGENATED HYDROCARBONS, DEGRADATION), (*IODIDES, RADIATION CHEMISTRY), NUCLEAR MAGNETIC RESONANCE, LINE SPECTRA, FREE RADICALS, CRYSTAL LATTICES, MASS SPECTRA, PHASE STUDIES, DISSOCIATION, MOLECULAR ASSOCIATION (U)
IDENTIFIERS: ETHYL IODIDE (U)

A STUDY OF THE INTERACTION OF COBALT-60 RADIATION WITH FROZEN ETHYL IODIDE IN BOTH THE GLASS AND POLYCRYSTALLINE STATES. THE FINAL REACTION PRODUCTS OF THE RADIOLYSIS WERE MEASURED AND COMPARED WITH THE INTERMEDIATE REACTION SPECIES THAT WERE OBSERVED WITH AN ELECTRON SPIN RESONANCE SPECTROMETER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 621 719
AMERICAN OIL CO WHITING IND

THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 DEC 61-1 MAY 65,
JUL 65 35P RONDEAU,R. E. ;HARRAH,L. A. ;
CONTRACT: AF33 616 8247
PROJ: AF-7360
TASK: 736003
MONITOR: AFML TR-65-236

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), NITRILES, CHEMISTRY BONDS, CYANIDES, GAS ANALYSIS, CHROMATOGRAPHIC ANALYSIS, HYDROCARBONS, REACTION KINETICS (U)
IDENTIFIERS: ACETYLENE/ETHYL, ACETYLENE DERIVATIVES, ALKYL RADICALS, COUPLING AGENTS, CROTONYLENE, DIOLEFINS, LIQUID PHASE, PROPYNE, RADIOLYSIS, RECOMBINATION, VAPOR PHASES (M)

G-VALUES FOR RADIOLYSIS PRODUCTS WERE DETERMINED FOR PROPYNE AND BUTYNE-1 IN THE VAPOR PHASE AND FOR BUTYNE-1, BUTYNE-2, PENTYNE-1, PENTYNE-2, HEXYNE-3, ACETONITRILE AND PROPIONITRILE IN THE LIQUID PHASE. THE RUPTURE OF A C-H BOND PROBABLY FROM A CARBON BETA TO THE TRIPLE BOND RESULTS IN H2, COUPLING PRODUCTS, AND H ATOM ADDITION. H ATOM ADDITION LEADS TO MONO AND POLY OLEFINS. THE RUPTURE OF A C-C BOND RESULTS IN FRAGMENTATION IN THE VAPOR PHASE BUT RECOMBINATION TO FORM 1.2-DIOLEFINS IN LIQUID PHASE. BOTH ALPHA AND BETA C-C BOND RUPTURE OCCUR. ALKYL BENZENE--ALKYNE TRIMERS--FORM, PROBABLY BY EXCITATION. ANALOGOUS C3N3 RING COMPOUNDS MAY FORM BUT WERE NOT DETECTED. GAS CHROMATOGRAPHY TECHNIQUES FOR ALKYNE AND NITRILE ANALYSES ARE DESCRIBED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 623 095
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

THE RADIATION-INDUCED DECOMPOSITION OF MILLIMOLAR CONCENTRATIONS OF HYDROGEN PEROXIDE IN AERATED 'PURE WATER'. (U)

AUG 65 23P BALKWELL,WILLIAM R. ;OLDHAM, SUSAN B. ;

REPT. NO. USNRDL-TR-903
PROJ: SF011 01 03
TASK: 11275

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HYDROGEN PEROXIDE, DECOMPOSITION), (*RADIATION CHEMISTRY, HYDROGEN PEROXIDE), WATER, IMPURITIES, REACTION KINETICS, DOSE RATE (U)

THE DECOMPOSITION OF HYDROGEN PEROXIDE IN AERATED 'PURE WATER' WAS STUDIED AS A FUNCTION OF DOSE AND INITIAL HYDROGEN PEROXIDE CONCENTRATION, (H202)0, IN THE 1 TO 100 MILLIMOLAR CONCENTRATION REGION. IRRADIATIONS WERE PERFORMED WITH A 2000-CURIE C060 SOURCE AT A DOSE RATE OF 12.8 KILORADS PER MINUTE. THE DECOMPOSITION OF HYDROGEN PEROXIDE WAS FOUND TO FOLLOW FIRSTORDER KINETICS WITH RESPECT TO PEROXIDE IN THE 1 TO 100 MILLIMOLAR CONCENTRATION RANGE. THE SPECIFIC PEROXIDE DECOMPOSITION RATE CONSTANT WAS OBSERVED TO DECREASE WITH AN INCREASE IN INITIAL PEROXIDE CONCENTRATION. THE DECOMPOSITION YIELD OF HYDROGEN PEROXIDE, G -(H202), AT A GIVEN DOSE WAS FOUND TO INCREASE SIGNIFICANTLY WITH INCREASING INITIAL PEROXIDE CONCENTRATION AND TO BE PROPORTIONAL TO THE SQUARE ROOT OF THE INITIAL PEROXIDE CONCENTRATION UP TO ABOUT 40 MILLIMOLAR PEROXIDE. THE PEROXIDE DECOMPOSITION YIELD FOR A GIVEN INITIAL PEROXIDE CONCENTRATION WAS OBSERVED TO DECREASE CONTINUALLY DURING IRRADIATION. THE RATE OF DECREASE WAS FOUND TO BE GREATER FOR HIGHER INITIAL CONCENTRATIONS OF PEROXIDE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 623 307
AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 7, 1 JUL-30 SEP 65,
OCT 65 52P MORTON,MAURICE ;
CONTRACT: AF04 611 9694
PROJ: AFSC 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-618 228.

DESCRIPTORS: (*RADIATION CHEMISTRY, POLYMERIZATION), (*POLYMERIZATION, LOW TEMPERATURE), (*HALOCARBON PLASTICS, SYNTHESIS(CHEMISTRY)), HALOCARBON PLASTICS, FLUORINE COMPOUNDS, ALKENES, REACTION KINETICS, FREE RADICALS, GAMMA RAYS, ORGANIC SOLVENTS, VINYL PLASTIC(U)

FURTHER INVESTIGATION OF THE RADIATION POLYMERIZATION OF FLUORAL IN METHYLENE CHLORIDE CONFIRMED THAT A RATE RELATION OF THE FORM RP = KP((M)(M)/S), (WHERE M = MONOMER, AND S = SOLVENT) CAN BE APPLIED OVER A RANGE OF MONOMER CONCENTRATION FROM 1 TO 6 MOLAR. THIS CAN BE TAKEN AS EVIDENCE FOR TERMINATION BY REACTION WITH THE METHYLENE CHLORIDE. THE RESULTS ARE CONSISTENT WITH A PREFERRED ANIONIC MODE OF POLYMERIZATION OF THIS MONOMER. OTHER EXPERIMENTS HAVE SHOWN THAT FLUORAL IS VERY READILY POLYMERIZED BY BASES, EVEN BY SUCH WEAKLY BASIC COMPOUNDS AS DIMETHYLFORMAMIDE. THE POLYMERIZATION OF THE FLUOROVINYL MONOMERS IS PROBABLY CAUSED BY THE HIGH ENERGY RADICAL-CATION FORMED AS A RESULT OF PRIMARY RADIOLYSIS, I.E. (USING VF AS AN EXAMPLE): CH2 = CH2 + PHOTON (YIELDS) .CH2CHF(+) + E(-). THIS SPECIES CAN POLYMERIZE AS A CATION OR AS A RADICAL; HOWEVER, AT LOW TEMPERATURE THE CATION REACTION IS THE MORE VIGOROUS: .CH2CHF(+) + VF (YIELDS) .(CH2CHF)MCH2CHF(+). (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 624 368 8/1 8/5
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POSITIVE-ION CHEMISTRY: HIGH YIELDS OF HEAVY HYDROCARBONS FROM SOLID METHANE BY IONIZING RADIATION, (U)

APR 64 5P DAVIS,DONALD R. ;LIBBY,W. F.
;

CONTRACT: AF-AFOSR-245-64
MONITOR: AFOSR , 65-1666

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN SCIENCE, V144 N3621 P991-2 MAY 22 1964. COPIES TO DDC USERS ONLY.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*METHANE, POLYMERIZATION), (*HYDROCARBONS, SYNTHESIS(CHEMISTRY)), (*POLYMERIZATION, RADIATION), (*RADIATION CHEMISTRY, HYDROCARBONS), SOLIDIFIED GASES, GAMMA RAYS, IONIZATION, ULTRAVIOLET, METEORS, GEOCHEMISTRY (U)

AT 77K SOLID METHANE IS POLYMERIZED RAPIDLY AND EFFICIENTLY TO HEAVY HYDROCARBONS BY COBALT-60 GAMMA RAYS. THE PRODUCT IS A VISCOUS OIL CONSISTING MAINLY OF SATURATED AND HIGHLY BRANCHED HYDROCARBONS CONTAINING AN AVERAGE OF ABOUT 20 CARBON ATOMS PER MOLECULE. THIS WOULD SEEM TO BE EVIDENCE FOR POSITIVE-ION CHEMICAL REACTIONS IN THE SOLID STATE ANALOGOUS TO THOSE PREVIOUSLY REPORTED TO OCCUR IN THE GASEOUS STATE AT PRESSURES ABOVE 0.01 MM-HG. IT WOULD THUS APPEAR THAT THE SOLAR IONIZING ULTRAVIOLET RADIATION (ABOUT 1 ERG/SQ CM/SEC AT THE EARTH) MUST POLYMERIZE METHANE AT AN APPRECIABLE RATE UNDER MANY LIKELY CONDITIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 626 609 7/5
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

C060 GAMMA-RADIOLYSIS OF DEUTERIUM-OXYGEN MIXTURES, (U)

NOV 65 21P KUBOSE,D. A. ;
REPT. NO. USNRDL-TR-931
PROJ: SF-111-01-03
TASK: 11275

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HEAVY WATER, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, REACTION KINETICS), COBALT, GAMMA RAYS, DEUTERIUM, OXYGEN, CONCENTRATION(CHEMISTRY), TRITIUM, REACTOR HAZARDS (U)

THE RATES OF FORMATION OF DEUTERIUM OXIDE IN C060 GAMMAIRRADIATED GASEOUS MIXTURES OF DEUTERIUM AND OXYGEN HAVE BEEN EXAMINED AT INITIAL DEUTERIUM CONCENTRATIONS, (D2)O, RANGING FROM 0.00037 TO 0.0037 MOLE/L. FIRST- AND ZEROORDER REACTION RATES WITH RESPECT TO DEUTERIUM WERE OBSERVED FOR THE LOW AND HIGH (D2)O, RESPECTIVELY. THE CORRESPONDING RATE CONSTANTS FOUND WERE 0.0053/HR AND 0.0000045 MOLE/L HR AT A DOSE RATE OF 5.61 X 10 TO THE 16TH POWER EV/CC HR. THE INITIAL G VALUES FOR DEUTERIUM OXIDE FORMATION, G(D2O), FOR THE LOW AND HIGH (D2)O WERE 2.9 AND 7.3, RESPECTIVELY. A SEARCH FOR REACTION PRODUCTS OTHER THAN DEUTERIUM OXIDE, USING FERROUS SULFATE AND TITANIUM SULFATE REAGENTS, ESTABLISHED THAT (A) NO DEUTERIUM PEROXIDE WAS FORMED AS A STABLE REACTION PRODUCT AND (B) A WALLSTABILIZED SPECIES, WHOSE IDENTITY WAS NOT EXTABLISHED, WAS OBSERVED; IT OXIDIZED THE FERROUS SULFATE REAGENT BUT DID NOT REACT WITH THE TITANIUM SULFATE REAGENT. AN 8-FOLD CHANGE IN THE SURFACE-TO-VOLUME RATIO OF THE IRRADIATION VESSEL DID NOT SIGNIFICANTLY AFFECT THE CONCENTRATION OF THIS SPECIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 628 301 7/5 11/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

INVESTIGATION OF THE ROLE OF FREE RADICALS IN THE ACETALDEHYDE POLYMERIZATION PROCESS IN THE SOLID PHASE UNDER GAMMA-IRRADIATION, (U)

NOV 65 16P PSHEZETSKII,V. S. ;TUPIKOV,V. I. ;
REPT. NO. FTD-TT-65-978,
MONITOR: TT , 66-60577

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF UNIDENTIFIED MONO. GETEROTSEPNYE VYSOKOMOLEKULYARNYE SOIEDINENIYA, SBORNIK STATEI, N. P. 1963 P213-9.

DESCRIPTORS: (*FREE RADICALS, ALDEHYDES), (*ALDEHYDES, POLYMERIZATION), (*ACETAL RESINS, PREPARATION), (*RADIATION CHEMISTRY, ALDEHYDES), RECOMBINATION, GAMMA RAYS, POLYMERS, DECOMPOSITION, ULTRAVIOLET RADIATION, CRYSTALS, PARAMAGNETIC RESONANCE, USSR (U)
IDENTIFIERS: ACETALDEHYDE (U)

THE EPR METHOD WAS USED TO INVESTIGATE THE PROCESSES OF FORMATION AND RECOMBINATIONS OF THE RADICALS THAT FORM IN CRYSTALLINE ACETALDEHYDE UNDER GAMMA-IRRADIATION. IT WAS ESTABLISHED THAT IN THE DOSE RANGE FROM 0.1 TO 10 MRAD, THE RADICAL CONCENTRATION CORRESPONDS IN ORDER OF MAGNITUDE TO THE CONCENTRATION OF POLYMER CHAINS. RADICAL RECOMBINATION TAKES PLACE ABRUPTLY AT TEMPERATURES COINCIDING WITH THE 'CRITICAL' TEMPERATURES DETERMINED BY THE THERMOGRAPHY METHOD. IT WAS FOUND THAT MONOMOLECULAR RAPTURE TAKES PLACE AT SMALL RADIATION DOSES; AT LARGER DOSES (0.2 MRAD AND UP), CHAIN RUPTURE TAKES PLACE IN ACCORDANCE WITH A BIMOLECULAR LAW. UV RADIATION INITIATES POLYMERIZATION OF CRYSTALLINE ACETALDEHYDE. THE NATURE OF THE RADICALS THAT APPEAR CORRESPONDS PERFECTLY TO THAT OF THE RADICALS FORMED ON EXPOSURE TO GAMMA-RADIATION; THE CONCENTRATION OF THE RADICALS CORRESPONDS TO THAT OF THE MOLECULAR CHAINS. THE RESULTS OBTAINED JUSTIFY THE ASSUMPTION THAT POLYMERIZATION OF CRYSTALLINE ACETALDEHYDE PROCEEDS BY THE RADICAL MECHANISM WHEN INITIATED BY EITHER IONIZING RADIATION OR ULTRAVIOLET LIGHT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 631 997 7/5
STATE UNIV OF NEW YORK STONY BROOK DEPT OF MATERIALS SCIENCE

THE THERMAL DECOMPOSITION OF IRRADIATED MATERIALS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 66 92P JACH,JOSEPH ;
REPT. NO. TR-2,
CONTRACT: NONR-4673(00),
TASK: NR-056-467,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PUBLICATION IN 'STUDIES IN RADIATION EFFECTS' VOL 2.

DESCRIPTORS: (*RADIATION CHEMISTRY, *DECOMPOSITION), AZIDES, OXALATES, PERMANGANATES, BROMATES, BARIUM, LEAD COMPOUNDS, SILVER COMPOUNDS, NICKEL COMPOUNDS, MERCURY COMPOUNDS, EXPLOSIVE, STYPHNATES, DAMAGE, RADIATION EFFECTS, DYNAMICS, HEAT OF ACTIVATION (U)
IDENTIFIERS: BROMATES (M)

A STUDY WAS MADE OF THE INFLUENCE OF IRRADIATION ON THE THERMAL DECOMPOSITION OF SOLID COMPOUNDS. THE ARTICLE IS DIVIDED INTO THREE SECTIONS. THE FIRST IS A SUMMARY OF PRESENT DAY KNOWLEDGE OF DECOMPOSITIONS OF UNIRRADIATED SOLIDS. THESE ARE THE BASIC CONTROL EXPERIMENTS AND THE MAIN PURPOSE OF THIS SECTION IS TO FAMILIARIZE THE READER WITH THE BASIC LANGUAGE OF THE FIELD. THE SECOND SECTION DEALS WITH THE INFLUENCE OF IRRADIATION ITSELF, WHILE THE THIRD SECTION EXAMINES VERY BRIEFLY SOME RELATED TOPICS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 632 666 7/5 11/9
GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY

X-IRRADIATION OF NORMAL SATURATED HYDROCARBONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., 1 OCT 64-30 SEP 64,

MAY 66 34P ALBRECHT,T. W. ;CHEEVER,P. R. ;
REPT. NO. FZK-272,
CONTRACT: AF 29(601)-6643,
PROJ: AF-6773,
TASK: 677302,
MONITOR: AFWL , TR-66-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HYDROCARBONS, *RADIATION CHEMISTRY), (*POLYETHYLENE PLASTICS, DAMAGE), ALIPHATIC, ALKENES, X RAYS, INFRARED SPECTROSCOPY, FILMS, CHEMICAL BONDS, HYDROGEN, LOW-TEMPERATURE, PARAMAGNETIC RESONANCE, FREE RADICALS, ETHYLENES, METHANE, IONIZATION, (U)IONIZATION (U)

THE DEVELOPMENT OF TRANS-VINYLENE IN X-IRRADIATED OCTACOSANE AND MARLEX 6002 POLYETHYLENE FILMS WAS MEASURED BY MEANS OF THE INFRARED SPECTROMETER. INITIAL DEVELOPMENT OF THE TRANS-VINYLENE IN THE OCTACOSANE FILMS AT TEMPERATURES OF 137K, 229K, AND 289K HAD A G-VALUE OF 2.1 PLUS OR MINUS 0.4 BONDS FORMED PER 100 EV, WITH DECAY OF THE TRANS-VINYLENE BEING MOST RAPID AT THE HIGHEST TEMPERATURE. HYDROGEN EVOLUTION FROM X-IRRADIATED FILMS OF THESE SAME MATERIALS WAS MEASURED BY MEANS OF THE MASS SPECTROMETER. THE EVOLUTION SHOWED A DECREASE AS THE TEMPERATURE OF THE IRRADIATION WAS DECREASED BELOW 194.5K, WITH PRACTICALLY NO HYDROGEN LIBERATION AT LIQUID-NITROGEN TEMPERATURE. WHEN THE COLD IRRADIATED FILMS WERE SLOWLY WARMED, THEY RELEASED A BURST OF HYDROGEN AT APPROXIMATELY 194.5K. THE AMOUNT OF HYDROGEN LIBERATED IN THE BURST WAS DEPENDENT UPON THE IRRADIATION TEMPERATURE AND THE IRRADIATING TIME. EPR (ELECTRON PARAMAGNETIC RESONANCE) SPECTRA OF THE FREE RADICALS IN IRRADIATED MARLEX 6002 POLYETHYLENE WERE PREDOMINANTLY OF SEVEN LINES CENTERED AT G = 2.003 AND SPANNING 120 GAUSS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 632 704 7/5
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)
NUCLEAR TECHNOLOGY LAB

RADIATION CHEMISTRY OF ALKYL HALIDES. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
JAN 65 249P CAPELLOS,C. ;
CONTRACT: AF 61(052)-456,
MONITOR: ARL , 65-157

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HALOGENATED HYDROCARBONS, *RADIATION), IODINE COMPOUNDS, HYDROGEN COMPOUNDS, IODIDES, IODINE, PEROXIDES, COMPLEX COMPOUNDS, ABSORPTION SPECTRA, OXYGEN, SOLVENTS, REACTION, GREAT BRITAIN (U)

ALKYL IODIDES AND THEIR MIXTURES WERE IRRADIATED WITH C060 GAMMA RAYS. HYDROGEN IODIDE AND IODINE FORMATION WAS MEASURED AS A FUNCTION OF DOSE FOR DEAERATED LIQUID AND SOLID ALKYL IODIDES AND THEIR MIXTURES. G-VALUES FOR HYDROPEROXIDE FORMATION IN AERATED ALKYL IODIDES WERE MEASURED AND EVIDENCE WAS FOUND FOR DIALKYL PEROXIDE FORMATION IN AERATED ALKYL IODIDES. ABSORPTION SPECTRA OF THE CHARGE TRANSFER COMPLEXES IRI FORMED IN THE PULSE RADIOLYSIS OF ALKYL IODIDES, WERE MEASURED AND MOLAR EXTINCTION COEFFICIENTS AND RATE CONSTANTS FOR THE DECAY OF IRI WERE OBTAINED. THE EFFECT OF OXYGEN AND IODINE ON THE FORMATION AND CONSTANT OF DECAY OF IRI WAS STUDIED. PULSE RADIOLYSIS STUDIES OF ALKYL IODIDES INDICATED THAT THE DECOMPOSITION OF SOLUTE IS LARGER THAN THAT EXPECTED ON THE BASIS OF ENERGY DIRECTLY ABSORBED BY THE SOLUTE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 633 293 7/5
DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA (ONTARIO)

THE RADIOLYSIS OF ALKALINE AQUEOUS SOLUTIONS CONTAINING HYDROGEN AND OXYGEN. (U)

OCT 65 6P ARMSTRONG,W. A. ;
REPT. NO. DCBRL-482,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN CANADIAN JOURNAL OF CHEMISTRY, V44 P737-41 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, WATER), (*WATER, RADIATION CHEMISTRY), SOLUTIONS(MIXTURES), BASES(CHEMISTRY), PH FACTOR, HYDROGEN PEROXIDE, OXYGEN, HYDROGEN, COBALT, RADIOACTIVE ISOTOPES, GAMMA RAYS, REACTION KINETICS, CANADA (U)

THE INITIAL YIELDS OF H202 IN AERATED WATER, G(H202)02, AND IN WATER CONTAINING H2 AND 02, G(H202)H2.02, HAVE BEEN MEASURED FOR ALKALINE SOLUTIONS IRRADIATED WITH CO-16 GAMMA RAYS. G(H202) 02 DECREASES WITH INCREASING PH FROM A VALUE OF 1.22 IN NEUTRAL SOLUTION TO 0.63 IN SOLUTIONS OF PH 13.92 AND THE RELATIONSHIP G(H202)02=G(H202)-1/2F(OH) +1/ 2G(RED) IS VALID OVER THE PH RANGE 7 TO 14. G(H202)H2,02 DECREASES FROM 3.30 IN NEUTRAL SOLUTION TO A MINIMUM OF 2.00 AT PH 11.35 AND THEN INCREASES TO 2.65 AT PH 13.92. THE EQUATION G(H202)H2.02 = G(H202)+1/2G(OH)+1/ 2G(RED); WHICH IS APPLICABLE FOR NEUTRAL SOLUTIONS, IS NOT VALID FOR BASIC SOLUTIONS. A REACTION MECHANISM IN ACCORDANCE WITH THE OBSERVED RESULTS AND THE LITERATURE VALUES OF THE RATE CONSTANTS OF LIKELY RADICAL REACTIONS HAS BEEN DEVELOPED. THE INCREASE IN G(H202)H2.02 AT PH > 12 IS ATTRIBUTED TO A DIFFERENCE IN THE RATE OF REACTION OF 03(-) WITH H202 AND H02(-),K(03(-) + H202/K(03(-) + H02(-) = 2.45. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 633 348 7/5 6/18
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

CHEMICAL DOSIMETRY OF IONIZING RADIATIONS, (U)

MAR 66 168P KABAKCHI,A. M. ;LAVRENTOVICH, YA. I. ;PENKOVSKII,V. V. ;
REPT. NO. FTD-TT-65-420,
MONITOR: TT , 66-61339

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF MONO. KHIMICHESKAYA DOZIMETRIYA IONIZIRUYUSHCHIKH IZLUCHENII, IZD-VO AKADEMIYA NAUK UKRAINSKOI SSR, KIEV, 1963, P1-76, 86-92, 105-35.

DESCRIPTORS: (*RADIATION CHEMISTRY, *RADIATION DOSAGE), HEALTH PHYSICS INSTRUMENTATION, TEST METHODS, SOLUTIONS(MIXTURES), GELS, SULFATES, IRON COMPOUNDS, CERIUM, BENZENE, DYES, NITROGEN COMPOUNDS, OXIDES, GLASS, CRYSTALS, ELECTROCHEMISTRY (U)

THIS VOLUME GENERALIZES THE THEORETICAL AND EXPERIMENTAL MATERIAL THAT HAS BEEN ACCUMULATED DURING RECENT YEARS IN THE FIELD OF CHEMICAL DOSIMETRY. ATTENTION IS FOCUSED ON THE JUSTIFICATION FOR THE USE OF CHEMICAL-DOSIMETRY METHODS TO SOLVE PROBLEMS THAT ARE DIFFICULT OR IMPOSSIBLE TO SOLVE BY OTHER METHODS (MEASUREMENT OF ABSORBED DOSE IN JOULES PER KILOGRAM, SEPARATE DETERMINATION OF THE DOSES OF SEVERAL TYPES OF RADIATION ACTING SIMULTANEOUSLY ON THE MEDIUM, MEASUREMENT OF LARGE DOSES, AND THE LIKE). THE BOOK SETS FORTH IN DETAIL THE TECHNIQUE OF DETERMINING SIZE OF DOSE BY CHEMICAL METHODS IN THE SOLUTION OF VARIOUS PRACTICAL PROBLEMS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 633 753 6/18 7/5
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA

STUDIES ON THE EFFECT OF RADIO-FREQUENCY WAVES IN BIOLOGICAL MACROMOLECULES, (U)

AUG 65 4P TAKASHIMA,SHIRO ;
PROJ: DA-61X99-26-001-03,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN IEEE TRANSACTIONS ON BIO-MEDICAL ENGINEERING VBME-13 N1 P28-31 JAN 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ENZYMES, RADIATION CHEMISTRY), (*DEOXYRIBONUCLEIC ACIDS, RADIATION CHEMISTRY), (*RADIATION CHEMISTRY, RADIOGIOLOGY), PROTEINS, RADIO WAVES, HIGH FREQUENCY, MEDIUM FREQUENCY, VERY HIGH FREQUENCY (U)

THE EFFECT OF RADIO-FREQUENCY ELECTRIC FIELDS ON VARIOUS BIOLOGIC MATERIALS WAS EXAMINED. PARTICULARLY, THE EFFECTS ON ALCOHOL DEHYDROGENASE AND DNA WERE CAREFULLY INVESTIGATED. TO AVOID THE EFFECTS OF HEATING, A PULSED ELECTRIC FIELD WAS USED, AND SAMPLES WERE ALSO RIGOROUSLY COOLED. THE ACTIVITY OF ALCOHOL DEHYDROGENASE AND THE STRUCTURE OF DNA WERE NOT ALTERED, HOWEVER, EVEN BY THE PROLONGED IRRADIATION AT HIGH-FIELD INTENSITY BETWEEN 1 AND ABOUT 60 MC/S. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 634 461 7/5 7/3
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH

POLYMER FORMATION IN IRRADIATED LIQUID PYRIDINE. (U)

NOV 65 6P PEARCE ,CAROL K. ;ELLISON, JOSEPH E. , JR;

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL CHEMISTRY V70 N5 P1582-7 1966.

DESCRIPTORS: (*PYRIDINES, POLYMERIZATION), (*RADIATION CHEMISTRY, PYRIDINES), GAMMA RAYS, X RAYS, DOSE RATE, MOLECULAR WEIGHT, HYDROGENATION, MOLECULAR ISOMERISM (U)

PYRIDINE WAS EXPOSED AT ROOM TEMPERATURE TO GAMMA OR X-RADIATION WITH TOTAL DOSAGES OF 3.5-73 X 10 TO THE 19TH POWER EV/G, USING DOSE RATES FROM 2.47 X 10 TO THE 17TH POWER TO 1.46 X 10 TO THE 21ST POWER EV/G HR. THE MOLECULAR WEIGHT OF THE POLYMER FORMED INCREASED WITH INCREASING DOSE, EVIDENCE OF HYDROGENATION WAS FOUND, AND THE POLYMER YIELD G-PYRIDINE = 3.66 WAS DETERMINED. THREE BIPYRIDINE ISOMERS WERE DETECTED IN THE POLYMER. THE BIPYRIDINE YIELDS WERE DEPENDENT ON TOTAL DOSE AND ALSO ON DOSE RATE. THE EXPERIMENTAL RESULTS ARE CONSISTENT WITH A MECHANISM INVOLVING C5H4N. AND C5H6N. RADICALS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 634 693 7/5
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

OBSERVATION OF SHORT-LIVED SPECIES PRODUCED BY X-RAY PULSES. (U)

JUN 66 12P KLEIN, NATHAN ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ARMY SCIENCE CONFERENCE (1966), U. S. MILITARY ACADEMY, WEST POINT, N. Y., 14-17 JUNE 1966. COMPLETE PROCEEDINGS AVAILABLE IN TWO UNCLASSIFIED VOLUMES AS AD-634 615 AND AD-634 616 AND ONE CLASSIFIED VOLUME AVAILABLE TO QUALIFIED DDC USERS.

DESCRIPTORS: (*RADIATION CHEMISTRY, *X RAYS), (*WATER, RADIATION CHEMISTRY), (*ELECTRON, RADIATION CHEMISTRY), HYDRATES, CHEMICAL REACTIONS, REACTION KINECTICS, CARBONATES (U)

A REPORT IS GIVEN ON STUDIES CONCERNING THE REACTIONS OF THE HYDRATED ELECTRON DURING AND IMMEDIATELY AFTER AN X-RADIATION PULSE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 634 859 7/5 7/3
AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO

THE CHEMICAL EFFECTS OF IRRADIATED TRIPLE-BOND COMPOUNDS. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 62-DEC 65,
APR 66 58P RONDEAU, ROGER E. ;HARRAH, LARRY A. ;
REPT. NO. AFML-TR-66-33,
PROJ: AF-7367,
TASK: 736701,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACETONITRILE, RADIATION CHEMISTRY), (*PROPIONITRILES, RADIATION CHEMISTRY), (*ALKYNES, *RADIATION CHEMISTRY), CHEMICAL ANALYSIS, ELECTRON PARAMAGNETIC RESONANCE, MASS SPECTROSCOPY, PHASE STUDIES, HYDROGEN, DECOMPOSITION, TOXICITY, CHEMICAL REACTIONS, POLYMERIZATION, FREE RADICALS, NITRILES (U)
IDENTIFIERS: *PROPIONITRILES (M)

THE RADIATION CHEMISTRY OF ACETONITRILE, PROPIONITRILE, AND FIFTEEN ALKYNES WAS STUDIED USING THREE DIFFERENT EXPERIMENTAL APPROACHES: PRODUCT ANALYSIS (PA), ELECTRON SPIN RESONANCE SPECTROMETRY(ESR), AND MASS SPECTROMETRY (MS). THE RESULTS OF EACH STUDY ARE DISCUSSED IN TERMS OF REACTIONS PROCEEDING THROUGH ENERGETIC INTERMEDIATES. THE ESR AND MS STUDIES DISCUSS THE INTERMEDIATES RESPONSIBLE FOR THE PRODUCT DISTRIBUTION FOUND IN THE PA STUDY. TOPICS OF DISCUSSION INCLUDE PHASE EFFECTS, EXTENT OF HYDROGEN EVOLUTION, TOXIC PRODUCT YIELDS, CYCLIZATION REACTIONS, INDUCED POLYMERIZATION, AND RADIATION PROTECTION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 635 039 4/1 7/5
RAND CORP SANTA MONICA CALIF

ELECTRON IONIZATION AND LOSS PROCESSES AND RATES, (U)

JUN 66 51P CRAIN, C. M. ;
REPT. NO. P-3389,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PRESENTATION AT CONFERENCE ON GROUND-BASED RADIO-WAVE PROPAGATION STUDIES OF THE LOWER IONOSPHERE, OTTAWA, CANADA, APRIL 11-15, 1966.

DESCRIPTORS: (*IONOSPHERE, IONIZATION), (*PHOTOCHEMICAL REACTIONS, IONOSPHERE), (*RADIATION CHEMISTRY, IONOSPHERE), (*COSMIC RAYS, IONOSPHERIC DISTURBANCES), PROTONS, ELECTRONS, NUCLEAR EXPLOSIONS, FISSION PRODUCTS, CHEMICAL REACTIONS, ATMOSPHERIC SOUNDING (U)

COSMIC RAYS AND NUCLEAR EXPLOSION FISSION PRODUCTS FACTORS WHICH RELATE TO THE IONIZATION STATE IN THE REGION BELOW ROUGHLY 100 KM ARE SUMMARIZED. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 639 000 7/5 7/3
GATES AND CRELLIN LABS OF CHEMISTRY CALIF INST OF TECH PASADENA

TRIPLET STATES IN RADIATION CHEMISTRY. RADIOCHEMICAL CIS-TRANS ISOMERIZATION. (U)

FEB 66 5P CALDWELL,RICHARD A. ;WHITTEN, DAVID G. ;HAMMOND,GEORGE S. ;
CONTRACT: AF 49(638)-1479,
MONITOR: AFOSR 66-1807

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN THE JOURNAL OF THE AMERICAN CHEMICAL SOCIETY V88 N12 P2659-63 JUN 20 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIATION CHEMISTRY, *MOLECULAR ENERGY LEVELS), (*MOLECULAR ISOMERISM, RADIATION CHEMISTRY), ALKENES, EXCITATION, AROMATIC COMPOUNDS, ETHYLENES, PROPENES, ORGANIC SOLVENTS, DIENES (U)
IDENTIFIERS: STILBENES (U)

RADIATION-INDUCED CIS-TRANS ISOMERIZATION OF THREE PAIRS OF OLEFINS WAS STUDIED BY DETERMINATION OF BOTH INITIAL RATES OF ISOMERIZATION AND THE COMPOSITION OF RADIOSTATIONARY STATES. THE DATA CORRELATE STRIKINGLY WELL WITH DATA OBTAINED IN SENSITIZED PHOTOISOMERIZATION REACTIONS OF THE SAME SUBSTRATES. CONSEQUENTLY, IT IS INFERED THAT ISOMERIZATION INVOLVES FORMATION AND DECAY OF EXCITED TRIPLET STATES OF THE OLEFINS. THE SUM OF THE G VALUES FOR THE TRANS TO CIS AND CIS TO TRANS REACTIONS IS TAKEN AS THE VALUE OF G FOR FORMATION OF OLEFIN TRIPLETS. EXCEPT IN VERY CONCENTRATED SOLUTIONS MOST OF THE EXCITATION MUST BE FIRST ABSORBED BY THE SOLVENT AND THEN TRANSFERRED TO THE SOLUTE. THE HIGHEST YIELD OF TRIPLETS MEASURED IN BENZENE WAS 9.9, AND A VALUE OF 20 WAS ESTIMATED IN AN EXPERIMENT IN WHICH PURE CIS-STILBENE WAS IRRADIATED. THE VERY HIGH G VALUES FOR TRIPLETS ARE ATTRIBUTED TO THE FACT THAT REACTIVE ENERGY ACCEPTORS CAN COMPETE EFFECTIVELY WITH TRIPLET-TRIPLET ANNIHILATION REACTIONS IN REGIONS OF HIGH EXCITATION DENSITY WITHIN SPURS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 639 389 7/5 11/10
STANFORD RESEARCH INST MENLO PARK CALIF

A STUDY OF ENERGY TRANSFER PROCESSES IN RADIATION CHEMISTRY: TRIPLET-TRIPLET TRANSFER IN POLYBUTADIENE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., MAR 65-30 JUN 66.
JUL 66 33P GOLUB,MORTON A. ;
CONTRACT: AF 33(615)-2354,
PROJ: AF-7367,
TASK: 736701,
MONITOR: AFML TR-66-2921

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*BUTADIENES, *RADIATION CHEMISTRY), (*PHOTOCHEMICAL REACTIONS, BUTADIENES), MOLECULAR ENERGY LEVELS, EXCITATION, TRANSPORT PROPERTIES, MOLECULAR ISOMERISM, POLYMERS, ALKENES, ADDITIVES, BENZENE, FILMS (U)
IDENTIFIERS: OCTENES, POLYBUTADIENE POLYMERS (U)

BENZENE PHOTO- AND RADIATION SENSITIZED CIS-TRANS ISOMERIZATION OF PENTENE-2, HEXENE-2, HEPTENE-2, AND OCTENE-2 ALL YIELD THE SAME PHOTO- AND RADIOSTATIONARY CIS/TRANS RATIO, VIZ., 1.0. YIELDS OF BENZENE TRIPLET FORMATION AND RADIATION-INDUCED UNSENSITIZED ISOMERIZATION OF THE ABOVE OLEFINES ARE REPORTED. THIN FILMS OF POLYBUTADIENE CONTAINING SMALL AMOUNTS OF CERTAIN TRIPLET-FORMING ORGANIC COMPOUNDS WERE ISOMERIZED ON EXPOSURE TO ULTRAVIOLET LIGHT. THIS DEMONSTRATES THAT TRIPLET-TRIPLET TRANSFER FROM SENSITIZER TO POLYMER DOUBLE BONDS IS QUITE EFFICIENT IN THE SOLID STATE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 261 7/5 7/3
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC CHEMISTRY

RESEARCH ON ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT.,
OCT 63 12P ALLAN,L. T. ;SWAN,G. A. ;
CONTRACT: AF-EOAR-61-35

UNCLASSIFIED REPORT

DESCRIPTORS: (*AMINES, *RADIATION CHEMISTRY), ORGANIC COMPOUNDS, PIPERIDINES, GAS CHROMATOGRAPHY, GAMMA RAYS, DECOMPOSITION, CHEMICAL BONDS, NITROGEN HETEROCYCLIC COMPOUNDS, GREAT BRITAIN (U)
IDENTIFIERS: DIETHYL AMINES (U)

THE RESEARCH ON THE RADIOLYSIS OF AMINES, DESCRIBED IN AD-642 264, WAS CONTINUED, WITH SPECIAL EMPHASIS ON THE EFFECTS OF GAMMA RADIATION ON DIETHYLAMINE AND N-ALLYLPIPERIDINE AND ON GAS CHROMATOGRAPHIC SEPARATIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 264 7/5 7/3
KING'S COLL NEWCASTLE-UPON-TYNE (ENGLAND) DEPT OF CHEMISTRY

RESEARCH ON ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT.,
OCT 62 10P ALLAN,L. T. ;SWAN,G. A. ;
CONTRACT: AF-EOAR-61-35

UNCLASSIFIED REPORT

DESCRIPTORS: (*AMINES, *RADIATION CHEMISTRY), ORGANIC COMPOUNDS, ALKENES, GAS CHROMATOGRAPHY, PIPERIDINES, DECOMPOSITION, MOLECULAR ISOMERISM, GREAT BRITAIN (U)
IDENTIFIERS: BUTYL AMINES, DIETHYL AMINES, PIPECOLINES, TRIETHYL AMINES (U)

A SUMMARY IS GIVEN OF INVESTIGATIONS OF THE GAMMA IRRADIATION OF AMINES. THE AMINES STUDIED INCLUDED TERTIARY AMINES (TRIETHYLAMINE AND 1-METHYLPIPERIDINE), A SECONDARY AMINE (DIETHYLAMINE) AND A PRIMARY AMINE (N-BUTYLAMINE). SOME WORK WAS ALSO CARRIED OUT ON THE IRRADIATION OF AMINE - OLEFIN MIXTURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 579 7/5
RENSSELAER POLYTECHNIC INST TROY N Y DEPT OF CHEMISTRY

SOME STUDIES OF THE IONIZING RADIATION INDUCED ISOTOPE EXCHANGE IN GASEOUS NITROGEN. (U)

DESCRIPTIVE NOTE: FINAL REPT., 1 JUL 61-30 JUN 64, OCT 66 168P BROWN,R. D. ;DONDES,S. ; HARTECK,P. ;
CONTRACT: DA-31-124-ARO(D)-140, DA-ARO(D)-31-124-G105
PROJ: DA-2-0-010501-B-700, RPI-321.9
MONITOR: AROD 3058.2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY AEC.

DESCRIPTORS: (*NITROGEN, *RADIATION CHEMISTRY), GASES, ISOTOPES, EXCITATION, NITROGEN COMPOUNDS, OXIDES, DECOMPOSITION, LABELED SUBSTANCES, DOSE RATE, OXYGEN, RARE GASES, EXCHANGE REACTIONS (U)

THE GAS PHASE ISOTOPIC EXCHANGE OF 14N2 WITH 15N2 UNDER IONIZING RADIATION WAS STUDIED IN A NUMBER OF SYSTEMS IMPORTANT TO THE IONIZING RADIATION INDUCED FIXATION OF NITROGEN. A LIMITED NUMBER OF EXPERIMENTS WERE DONE AT TEMPERATURES GREATER THAN THE AMBIENT TEMPERATURE OF THE BROOKHAVEN NATIONAL LABORATORY GRAPHITE RESEARCH REACTOR. SOME EXPERIMENTS WERE ALSO PERFORMED USING A 60CO SOURCE AND SOME UTILIZING THE FISSION PRODUCTS OF 235U. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 646 645 7/5 6/1
LOUISVILLE UNIV KY

ELECTROMAGNETIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 MAR 63-31 AUG 66,
AUG 66 34P CRAWFORD,THOMAS H. ;
CONTRACT: DA-49-193-MD-2411

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, ELECTROMAGNETIC RADIATION), (*TRYPSIN, MAGNETIC FIELDS), (*COMPLEX COMPOUNDS, RADIATION CHEMISTRY), (*COPPER COMPOUNDS, MAGNETIC PROPERTIES), (*MAGNETIC FIELDS, BIOCHEMISTRY), ENZYMES, ELECTRON PARAMAGNETIC RESONANCE, REACTION KINETICS, CHEMICAL BONDS, AMINO ACIDS, PEPTIDES, MOLECULAR ASSOCIATION, PH FACTOR, PROTEINS (U)

AN INVESTIGATION OF THE INTERACTION OF THE ENZYME TRYPSIN WITH MAGNETIC FIELDS WAS UNDERTAKEN. IT APPEARS THAT UNDER THE CONDITIONS STUDIED THERE IS NO DETECTABLE MAGNETIC EFFECT ON THE ACTIVITY OF THIS ENZYME. ESR WAS USED TO DETERMINE STRUCTURAL CHANGES WHICH MIGHT BE INDUCED IN COPPER II-TRYPSIN SOLUTIONS ON EXPOSURE TO MAGNETIC FIELDS OF 14,000 GAUSS. THE BONDING PARAMETER ALPHA SQUARE WAS EVALUATED FOR SEVERAL AMINO ACID, PEPTIDE AND TRYPSIN COMPLEXES WITH COPPER II IONS AT LIQUID NITROGEN TEMPERATURES. THE CHANGES IN THE NATURE OF THE METAL TO LIGAND BONDING IS REFLECTED IN CHANGING VALUES OF ALPHA SQUARE AS THE PH IS VARIED. THERE APPEARS TO BE A REASONABLE CORRELATION BETWEEN THOSE STRUCTURES PROPOSED IN THE LITERATURE AS DETERMINED BY SPECTROPHOTOMETRIC AND POTENTIOMETRIC TECHNIQUES AND THE VALUES OF ALPHA SQUARE AS DETERMINED FROM ESR MEASUREMENTS. OF PARTICULAR INTEREST IS THE MARKED CHANGE IN THE NATURE OF THE BONDING IN THE TRYPSIN--COPPER II COMPLEX OVER THE RANGE PH 5-6, WHICH SUGGESTS A NOTABLE REARRANGEMENT FROM PRIMARILY CARBOXYLATE BONDING SITES TO AMIDE AND AMINE BONDING SITES. THERE DOES NOT APPEAR TO BE ANY DETECTABLE CHANGE IN ESR PARAMETERS ON EXPOSURE OF TRYPSIN-COPPER II SAMPLES TO MAGNETIC FIELDS OF APPROXIMATELY 14,000 GAUSS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 647 576 7/5 7/3 7/4
NATIONAL BUREAU OF STANDARDS WASHINGTON D C

RADIATION-INDUCED POLYMERIZATION AND OTHER REACTIONS OF N-PERFLUOROPENTADIENE-1,4 AT HIGH TEMPERATURE AND PRESSURE, (U)

SEP 64 23P BROWN,D. W. ;FEARN,J. E. ;LOWRY,R. E. ;
PROJ: DA-20014501B13B
MONITOR: AROD 2703:5

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF POLYMER SCIENCE V3 PTA P1641-60 1965.
SUPPLEMENTARY NOTE: PRESENTED AT DIVISION OF POLYMER CHEMISTRY, NATIONAL AMERICAN CHEMICAL SOCIETY MEETING (145TH), NEW YORK, N. Y., SEPTEMBER 1963.

DESCRIPTORS: (*RADIATION CHEMISTRY, POLYMERIZATION), (*DIENES, HIGH TEMPERATURE), HIGH PRESSURE, FREE RADICALS, POLYMERS, MOLECULAR WEIGHT, ENTROPY, CHEMICAL BONDS (U)

THE RADIATION-INDUCED POLYMERIZATION OF N-PERFLUOROPENTADIENE-1,4 WAS STUDIED AT TEMPERATURES OF 100-170C. AND PRESSURES OF 8,000-15,000 ATM. KINETIC EVIDENCE INDICATES THAT POLYMERIZATION OCCURS BY A FREE RADICAL REACTION; THE ACTIVATION ENERGY IS BETWEEN 14 AND 17 KCAL./MOLE AND THE ACTIVATION ENTROPY IS - 8(PLUS OR MINUS) 5 E.U./MOLE. TRANSFER WITH MONOMER LIMITS THE NUMBER-AVERAGE DEGREE OF POLYMERIZATION TO VALUES OF 40 OR LESS EXCEPT IN SPECIAL CIRCUMSTANCES. DIMERIZATION AND DOUBLE BOND MIGRATION OCCUR TO SOME EXTENT; N-PERFLUOROPENTADIENE-1,3 IS FORMED IN THE LATTER PROCESS. IT AND THE 1,4-DIENE COPOLYMERIZE; THE LATTER UNDERGOES CYCLIC ADDITION SO THAT THE POLYMERS ARE SOLUBLE AND HAVE LITTLE PERFLUOROVINYL UNSATURATION. THE POLYMERS ARE BRITTLE IF THE FRACTION OF 1,3-DIENE IN THE POLYMER IS LESS THAN 0.1. THEY ARE RUBBERY AND OF CONSIDERABLY HIGHER MOLECULAR WEIGHT IF THE FRACTION OF 1,3-DIENE IS GREATER THAN 0.4. THE THERMAL STABILITY OF THE POLYMERS DECREASES AS THE CONTENT OF 1,3-DIENE INCREASES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 647 795 7/5
STATE UNIV OF NEW YORK STONY BROOK

CHEMICAL REACTIVITY AT DEFECT SITES IN SOLIDS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 67 31P JACH,JOSEPH ;
REPT. NO. TR-3
CONTRACT: NONR-4673(00)
PROJ: NR-056 467

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-631 997.

DESCRIPTORS: (*RADIATION CHEMISTRY, DECOMPOSITION), SODIUM COMPOUNDS, BROMINE COMPOUNDS, OXIDES, CRYSTAL DEFECTS, REACTION KINETICS, EXCHANGE REACTIONS, SOLIDS, CHEMICAL REACTIONS, NUCLEAR RADIATION (U)
IDENTIFIERS: SODIUM BROMATE (U)

A STUDY WAS MADE OF THE THERMAL DECOMPOSITION OF NABRO3 WHICH THERMALLY DECOMPOSES ACCORDING TO THE EQUATION NABRO3 YIELDS NABR + 3/2 O2. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 649 501 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION CHEMISTRY, ITS PRINCIPAL TRENDS AND PROBLEMS, (U)

OCT 60 26P BAKH,N. A. ;DOLIN,P. I.
;
REPT. NO. MCL-583/III
MONITOR: TT 61-19400

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RADIATSIONNAYA KHIMIYA FE OSNOVNYE NAPRAVLENIYA I ZADACHI, TRANS. OF AKADEMIYA NAUK SSSR. VESTNIK, V28 N10 P20-33 1958.

DESCRIPTORS: (*RADIATION CHEMISTRY, REPORTS), CHARGED PARTICLES, ENERGY, ELECTRONS, IONS, IONIZATION TRAILS, GASES, PARTICLE TRAJECTORIES, EXCITATION, POLYMERS, USSR (U)

RADIATION CHEMISTRY EMBRACES A WIDE RANGE OF DIVERSE PROBLEMS OF THEORETICAL AND APPLIED NATURE. IN THE INITIAL PERIOD OF ITS DEVELOPMENT, ITS APPLIED TREND WAS DOMINATED BY QUESTIONS CONNECTED WITH PROTECTION AGAINST THE HARMFUL ACTION OF RADIATION ON VARIOUS SUBSTANCES AND MATERIALS. TODAY, BESIDES THESE QUESTIONS, THE PROBLEM OF UTILIZING RADIATION TO ACCOMPLISH CHEMICAL PROCESSES YIELDING VALUABLE CHEMICAL PRODUCTS IS BEING MORE AND MORE INSISTENTLY ADVANCED. CONSIDERATION IS GIVEN TO THE STATE OF THE MOST IMPORTANT TRENDS IN MODERN RADIATION CHEMISTRY, AND TO DISCUSS THOSE PROBLEMS OF THE IMMEDIATE FUTURE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 650 085 7/5
DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA (ONTARIO)

GAMMA RADIOLYSIS OF CYSTINE IN AQUEOUS SOLUTION. DOSE-RATE EFFECTS AND A PROPOSED MECHANISM, (U)

JUN 66 6P PURDIE,JOHN W. ;
REPT. NO. DCBRL-508

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF THE AMERICAN CHEMICAL SOCIETY V89 P226-30 1967.

DESCRIPTORS: (*AMINO ACIDS, *RADIATION CHEMISTRY), SOLUTIONS(MIXTURES), ORGANIC SULFUR COMPOUNDS, PHOTOLYSIS, DOSE RATE, FREE RADICALS, CHEMICAL REACTIONS, CHEMICAL BONDS, MOLECULAR ASSOCIATION, GAMMA RAYS, CANADA (U)
IDENTIFIERS: CYSTINE (U)

SOLUTIONS OF L-CYSTINE (CYSSCY) IN WATER (0.0003 M) WERE EXPOSED TO 10,000 RADS OF COBALT-60 GAMMA RAYS. G VALUES WERE DETERMINED FOR THE FOLLOWING PRODUCTS: CYSO2H, CYSO3H, CYSO2SH, CYSSO3H, CYSH, AND CYSSSCY. THE EFFECT OF OH AND SOLVATED ELECTRON SCAVENGERS ON THE YIELDS WAS ALSO INVESTIGATED. THE YIELDS OF CYSO2H, CYSO3H, AND CYSH WERE DOSE-RATE DEPENDENT IN THE RANGE 1 TO 800 RADS/MIN. A MECHANISM FOR THE RADIOLYSIS IS PRESENTED AND DISCUSSED: CYSOH APPEARS TO BE THE MAIN PRECURSOR OF BOTH CYSO2H AND CYSO3H WITH O2(-) PARTICIPATING IN FORMATION OF THE LATTER. CYSSSCY, THE YIELD OF WHICH WAS INDEPENDENT OF DOSE RATE, IS PROBABLY PRODUCED FROM CYSTINE BY REACTION WITH CYS RADICALS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 653 381 7/5 7/4 7/3
CALIFORNIA UNIV LOS ANGELES

CHEMISTRY OF POSITIVE IONS. VI. POSITIVE-ION CHEMISTRY IN SOLID METHANE, (U)

JUL 66 15P DAVIS,DONALD R. ;LIBBY,W. F. ;MEINSCHEIN,W. G. ;
CONTRACT: AF-AFOSR-245-65
PROJ: AF-9710
TASK: 971003
MONITOR: AFOSR 67-1232

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN THE JOURNAL OF CHEMICAL PHYSICS, V45 N12 P4481-92 15 DEC 1966.
SUPPLEMENTARY NOTE: SEE ALSO AD-613 305.

DESCRIPTORS: (*RADIATION CHEMISTRY, METHANE), (*METHANE, POLYMERIZATION), IONS, PHOTOLYSIS, DOSE RATE, SOLIDIFIED GASES, ALKANES, REACTION KINETICS, POLYMERS, MICROANALYSIS, NUCLEAR MAGNETIC RESONANCE, INFRARED SPECTRA, GAS CHROMATOGRAPHY, HEAT OF COMBUSTION (U)

THE EFFECTS OF GAMMA RAYS (CO60) ON CRYSTALLINE METHANE AT 77K ARE THE PRODUCTION OF AN OIL OF MEAN COMPOSITION C20H40 AND HYDROGEN. LITTLE ELSE IS FORMED. THIS REMARKABLE TRANSFORMATION IS THOUGHT TO BE DUE TO THE CHEMICAL PROPERTIES OF THE IONS MADE POSSIBLY CH2(+) OR CH3(+). THE POLYMER APPARENTLY IS FORMED IN THE SAME SIZE AT ALL DOSES SINCE ITS MOLECULAR WEIGHT (BY OSMOTIC PRESSURE) WAS FOUND TO BE THE SAME FOR 150 MEGARADS AS FOR 4. IT SEEMS LIKELY THAT THIS TYPE OF REMARKABLE POLYMERIZATION REACTION IS IN PART THE ORIGIN OF THE MILLER-UREY COMPOUNDS AND OF THOSE IN METEORITES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 654 502 7/5 18/2 9/2
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

A COMPUTER PROGRAM FOR KINETIC TREATMENT OF RADIATION CHEMICAL DATA, (U)

JUN 67 21P KLEIN,NATHAN ;
REPT. NO. NDL-TM-36
PROJ: DA-1N022601A089-03

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, COMPUTER PROGRAMS), (*RADIOACTIVE ISOTOPES, DIGITAL COMPUTERS), DIFFERENTIAL EQUATIONS, DOSE RATE, RADIATION DOSAGE, PROGRAMMING LANGUAGES, PH FACTOR, NUMERICAL INTEGRATION (U)

THE COMPUTER PROGRAM DESCRIBED IN THIS REPORT WAS DESIGNED TO HELP THE RADIATION CHEMIST KINETICALLY EVALUATE HIS DATA. ALTHOUGH THE PROGRAM, PR III, WAS SPECIFICALLY DESIGNED FOR DATA EVALUATION IN PULSE RADIOLYSIS, IT MAY BE MODIFIED TO PROCESS DATA OBTAINED WITH MUCH LOWER DOSE RATES THAN THOSE ENCOUNTERED IN PULSE RADIOLYSIS, E.G. RADIOACTIVE ISOTOPE RADIATION SOURCES. THE PROGRAM ASSUMES THAT ALL REACTIVE SPECIES ARE HOMOGENEOUSLY DISTRIBUTED IN SOLUTION AND REQUIRES AS INPUT THE INITIAL CONCENTRATION OF ALL SPECIES THAT WILL 'REACT' DURING THE COURSE OF THE CALCULATION. IN ADDITION, THE YIELD OF ALL SPECIES PRODUCED BY THE RADIATION IS A REQUIRED INPUT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 654 510 7/5 11/9 11/1
PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

RADIATION GRAFT COPOLYMERIZATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 67 124P HOLAHAN,F. S. ;LEVI,D.
W. ;
PROJ: DA-1C014501B13A
MONITOR: PA TR-3567

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, COPOLYMERIZATION), (*COPOLYMERIZATION, REVIEWS), POLYMERS, SYNTHESIS(CHEMISTRY), POLYETHYLENE PLASTICS, HALOGENATED HYDROCARBONS, POLYAMIDE PLASTICS, ACRYLONITRILE POLYMERS, POLYVINYL ALCOHOL, POLYESTER PLASTICS, ACRYLIC RESINS, SILICONES, CELLULOSIC RESINS, BIBLIOGRAPHIES (U)
IDENTIFIERS: GRAFT POLYMERS (U)

THE LITERATURE ON RADIATION GRAFT COPOLYMERIZATION IS REVIEWED FOR THE PERIOD BETWEEN THE LATE NINETEEN FIFTIES AND THE MIDDLE OF 1966. INCLUDED ARE DESCRIPTIONS OF STUDIES RELATED TO THE VARIOUS TYPES OF GRAFTING REACTIONS, THE EVALUATION OF FACTORS IMPORTANT IN GRAFTING REACTIONS, AND PROPERTIES OF THE GRAFTED POLYMERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 656 760 7/5 11/9
QUARTERMASTER RESEARCH AND ENGINEERING COMMAND NATICK MASS

IRRADIATION 'FACTOR-DEPENDENCY'. STYRENE WITH ADDITIVES. (U)

DESCRIPTIVE NOTE: RADIATION CHEMISTRY LAB. SERIES RESEARCH REPT.,
NOV 60 32P DEGERING,ED. F. ;CALDARELLA, G. J. ;EVANS,FLORA E. ;GRIB,STEPHEN ;SMITH, THROOP ;
REPT. NO. RR-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PB-145 895.

DESCRIPTORS: (*STYRENE PLASTICS, *RADIATION CHEMISTRY), STYRENES, POLYMERIZATION, ADDITIVES, SILICONES, FATTY ACIDS, FATTY ACID ESTERS, ACRYLIC RESINS, VINYL PLASTICS, ACETATES, ACRYLONITRILE POLYMERS, ELECTRON IRRADIATION, DOSE RATE, MOISTURE (U)
IDENTIFIERS: ACRYLIC ACID, METHYLACRYLATE POLYMERS (U)

STUDIES INVOLVING THE IRRADIATION OF STYRENE (CONTAINING 1% SILICONE OIL, ACRYLIC ACID, METHACRYLIC ACID, METHYL ACRYLATE, BUTYL ACRYLATE, VINYL ACETATE, OR ACRYLONITRILE) WITH A 2 MEV ELECTRON BEAM UNDER VARIOUS EXPOSURE CONDITIONS YIELDED THE FOLLOWING CONCLUSIONS: (1) THE EFFECT OF AN ADDITIVE IS A FUNCTION OF DOSE RATE WITH RESPECT TO BOTH RELATIVE YIELD AND THE MOLECULAR WEIGHT OF THE POLYMER, (2) THE MOLECULAR WEIGHT DECREASES IN GENERAL WITH AN INCREASE IN DOSE RATE, IRRESPECTIVE OF THE ADDITIVE, (3) AN ADDITIVE WHICH SIGNIFICANTLY INCREASES THE YIELD TENDS IN GENERAL TO PRODUCE SOMEWHAT LOWER MOLECULAR WEIGHT POLYMERS THAN DO OTHER ADDITIVES WHICH GIVE LOWER YIELDS, (4) AN ADDITIVE, AS A FUNCTION OF DOSE RATE, MAY EITHER INCREASE OR DECREASE THE YIELD OF POLYMER OBTAINED BY THE IRRADIATION-INDUCED POLYMERIZATION OF SOME VINYL MONOMERS, AND (5) THE EFFICIENCY OF THE POLYMERIZATION DECREASES MARKEDLY FOR THE HIGHER DOSE RATES USED IN THIS STUDY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 657 604 7/5 20/12
UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF CHEMISTRY

IRRADIATION OF KCL CRYSTALS CONTAINING KSH. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 67 11P FACEY,O. E. ;JACOBS,P. W. M. ;
CONTRACT: N00014-66-C-0142

UNCLASSIFIED REPORT

DESCRIPTORS: (*POTASSIUM COMPOUNDS, *RADIATION CHEMISTRY), (*COLOR CENTERS, RADIATION CHEMISTRY), CHLORIDES, SULFIDES, HYDRIDES, CRYSTAL LATTICES, X RAYS, ULTRAVIOLET RADIATION, PHOTOLYSIS, EXCITATION, BAND SPECTRA, DAMAGE, RADIATION EFFECTS (U)
IDENTIFIERS: POTASSIUM CHLORIDE, POTASSIUM HYDROSULFIDE (U)

WHEN CRYSTALS OF KCL CONTAINING KSH ARE IRRADIATED WITH X-RAYS AT ROOM TEMPERATURE A PROMINENT U-BAND DEVELOPS, THUS CONFIRMING THE REACTION SH(-) TO H(-) + S-I WHERE H(-) DENOTES A HYDRIDE ION ON A NORMAL LATTICE SITE AND S-I AN INTERSTITIAL S ATOM. PHOTOLYSIS WITH U.V. LIGHT AT 10K RESULTS IN THE ABOVE REACTION AND ALSO IN THE REACTION SH(-) TO H-I + S(-). THUS EXCITED SH(-)* IONS CAN BREAK UP IN EITHER OF TWO WAYS, NEITHER OF WHICH REQUIRES MUCH THERMAL ENERGY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 658 864 7/5 9/2
JOHNSTON (WILLIAM H) LABS INC BALTIMORE MD

FUNDAMENTAL STUDIES RELATING TO THE RADIATION CHEMISTRY OF SMALL ORGANIC MOLECULES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 AUG 62-15 DEC 66,
JAN 67 192P VESTAL,MARVIN ;LERNER,GERALD
;
CONTRACT: AF 33(657)-10846
PROJ: AF-7023
MONITOR: ARL 67-0114

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, NUMERICAL METHODS AND PROCEDURES), (*COMPUTER PROGRAMS, RADIATION CHEMISTRY), ORGANIC COMPOUNDS, POLYATOMIC MOLECULES, EXCITATION, HEAT OF ACTIVATION, MASS SPECTRA, MOLECULAR ENERGY LEVELS, IONIZATION, PROPANE, FLOW CHARTING (U)

THE REPORT DESCRIBES METHODS FOR PERFORMING CALCULATIONS ON THE UNIMOLECULAR REACTIONS OF EXCITED POLYATOMIC MOLECULE IONS. THE THEORETICAL BASIS FOR THE CALCULATIONS IS PRESENTED. THE COMPLETE FORTRAN PROGRAM DEVELOPED FOR PERFORMING THESE CALCULATIONS IS GIVEN TOGETHER WITH FLOW CHARTS AND DETAILED DESCRIPTIONS FOR THE PROGRAM. THE COMPLETE INPUT DATA DECK FOR PROPANE IS GIVEN AND SOME EXAMPLES OF THE RESULTS ARE INCLUDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 659 776 7/5 18/4
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

GAMMA AND NEUTRON RADIOLYSIS OF THE SYSTEM TRICHLOROETHYLENE-OXYGEN-WATER. (U)

DESCRIPTIVE NOTE: REVISED ED.,
FEB 67 16P SASSE,RONALD A. ;
REPT. NO. NDL-SP-21

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN HEALTH PHYSICS V13 P1015-24 1967.

DESCRIPTORS: (*HALOGENATED HYDROCARBONS, *RADIATION CHEMISTRY), (*DOSIMETERS, RADIATION CHEMISTRY), OXYGEN, WATER, SOLUTIONS(MIXTURES), CHLORINE COMPOUNDS, ETHYLENES, PHOTOLYSIS, GAMMA RAYS, NEUTRONS, ELECTROCHEMISTRY, DOSE RATE (U)
IDENTIFIERS: ETHYLENE/TRICHLORO (U)

THE GAMMA AND NEUTRON RADIOLYSIS OF AQUEOUS TRICHLOROETHYLENE (TCE) WAS INVESTIGATED. THE YIELD OF H(+) WAS DETERMINED BY DYNAMIC MEASUREMENT OF ELECTRICAL CONDUCTIVITY. YIELDS OF OTHER PRODUCTS (CL(-), H2O2, H2, CO2, CO, AND HCOCOOH) WERE QUANTITATIVELY DETERMINED BY VARIOUS ANALYTICAL TECHNIQUES. G(CL(-)) IS GENERALLY EQUAL TO G(H(+)). G(H(+)) INCREASES WITH INCREASING OXYGEN CONCENTRATION, INCREASING TCE CONCENTRATION, AND DECREASING LINEAR ENERGY TRANSFER (LET). THE MAXIMUM VALUE OBSERVED WAS 126. G(CO2), AND G(HCOCOOH) WERE SMALLER BY FACTORS OF 5 TO 10. G(H2) AND G(H2O2) WERE INDISTINGUISHABLE FROM THOSE OBSERVED IN PURE WATER. THE OXYGEN RICH TCE SYSTEM YIELDS WERE FOUND TO BE VERY DOSE-RATE DEPENDENT WHEREAS THE AIR-FREE SYSTEM WAS NOT. A MECHANISM IS PROPOSED FOR THE AIR-FREE TCE SYSTEM BASED ON LIMITING G VALUES OBTAINED BY ADDING SCAVENGERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 661 875 7/5 7/4
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

MASS SPECTROMETRIC INVESTIGATION OF H. AND H2 TRANSFER REACTIONS OF HYDROCARBON IONS. (U)

AUG 66 9P ABRAMSON,FRED P. ;FUTRELL, JEAN H. ;

REPT. NO. ARL-67-0110
PROJ: AF-7023
TASK: 702310

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL CHEMISTRY V71 P1233-7 APR 1967.

DESCRIPTORS: (*RADIATION CHEMISTRY, HYDROCARBONS), (*HYDROCARBONS, *MASS SPECTROSCOPY), ALKANES, CYCLOALKANES, ALKENES, FREE RADICALS, HYDROGEN, PHOTOLYSIS, PROBABILITY, TRACER STUDIES (U)

REACTIONS BETWEEN ALKANE AND CYCLOALKANE MOLECULAR IONS AND UNSATURATED MOLECULES WERE INVESTIGATED BOTH IN A TANDEM MASS SPECTROMETER AND IN A CONVENTIONAL INSTRUMENT. THE REACTIONS INVOLVING THE TRANSFER OF H. OR H2 FROM THE ION TO THE UNSATURATE ARE REPRESENTED BY RH2(+) + ACCEPTOR TO R(+) + PRODUCT MOLECULE OR RH(+) + PRODUCT RADICAL. IN ADDITION, THE RELATIVE CROSS SECTIONS FOR THE REACTIONS OF CYCLOHEXANE IONS WITH A NUMBER OF ACCEPTOR MOLECULES ARE REPORTED. THE EFFECTS OF TRANSLATIONAL ENERGY WERE INVESTIGATED FOR ION ENERGIES BETWEEN 0.4 AND 2.6 EV IN ORDER TO GAIN INFORMATION ABOUT THE MECHANISM OF THE REACTION. STUDIES OF NEUTRAL TRANSFER FROM PARTIALLY LABELED MOLECULE IONS PROVIDE SOME INDICATION OF THE POSITIONAL PROBABILITIES OF THE REACTION. IMPLICATIONS OF THESE REACTIONS TO RADIATION CHEMISTRY ARE DISCUSSED BRIEFLY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 661 887 7/5 7/4 20/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ELEMENTARY PROCESSES OF HIGH-ENERGY CHEMISTRY (COLLECTION OF ARTICLES). (U)

MAY 67 449P
REPT. NO. FTD-MT-66-04

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO. ELEMENARNYE PROTSESSY KHIMII VYSOKIKH ENERGII, MOSCOW, 1965 P1-318. ALSO PUB. AS SIMPOSIUM PO ELEMENTARNYM PROTSESSAM KHIMII VYSOKIKH ENERGII, MOSCOW, 18-22 MAR 63. TRUDY.

DESCRIPTORS: (*PHOTOCHEMICAL REACTIONS, SYMPOSIA), (*RADIATION CHEMISTRY, SYMPOSIA), (*THERMOCHEMISTRY, SYMPOSIA), ELECTRONS, IONS, FREE RADICALS, ATOMIC ENERGY LEVELS, EXCITATION, INTERACTIONS, IONOSPHERE, PLASMA MEDIUM, LUMINESCENCE, DAMAGE, RADIATION EFFECTS, REACTION KINETICS, ENERGY CONVERSION, LASERS, USSR (U)

THE DOCUMENT IS COMPRISED OF TRANSLATIONS OF CONDENSED VERSIONS OF OVER 60 PAPERS PRESENTED AT A SYMPOSIUM SPONSORED BY THE AN SSR INSTITUT KHIMICHESKOY FIZIKI IN MARCH 1963. PAPERS CONCERNING THE FOLLOWING AREAS OF RESEARCH ARE INCLUDED: ELEMENTARY PROCESSES IN GASES WITH THE PARTICIPITATION OF ELECTRONS AND IONS; GAS PHASE REACTIONS OF HOT ATOMS; GENERAL QUESTIONS IN THE THEORY OF ELEMENTARY GAS REACTIONS; REACTIONS IN THE IONOSPHERE; COMPLEX PROCESSES AT HIGH TEMPERATURES AND IN PLASMAS; ELECTRON ENERGY TRANSFER; ELECTRONS AND IONS IN SOLID ORGANIC MEDIA; FORMATION AND RECOMBINATION OF FREE RADICALS IN SOLIDS; MECHANISMS OF PHOTOCHEMICAL AND RADIATION-CHEMICAL REACTIONS; CHEMICAL REACTIONS AS POSSIBLE SOURCES OF INDUCED RADIATION. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 662 061 7/5 9/2 4/1
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

SOLUTIONS OF REACTION RATE EQUATIONS PERTAINING TO ELECTRON IRRADIATION OF 4:1 MIXTURES OF N2 AND 02, (U)

SEP 67 122P NILES,FRANKLIN E. ;LORTIE, EDNA L. ;
REPT. NO. BRL-1372

UNCLASSIFIED REPORT

DESCRIPTORS: (*NITROGEN, *ELECTRON IRRADIATION), (*OXYGEN, ELECTRON IRRADIATION), (*RADIATION CHEMISTRY, REACTION KINETICS), (*REACTION KINETICS, *COMPUTER PROGRAMS), IONS, GAS IONIZATION, NITROGEN OXIDES, GAS DISCHARGES, ELECTRON BEAMS (U)

ONE OF THE KENESHEA COMPUTER CODES (SEE AD-424 173) WAS ADAPTED FOR USE ON THE BALLISTIC RESEARCH LABORATORIES ELECTRONIC SCIENTIFIC COMPUTER. USING THIS MODIFIED CODE, REACTION RATE EQUATIONS WERE SOLVED FOR THE FOLLOWING 15 SPECIES: E, NO2(-), O(-), O2(-), O3(-), N2(+), NO(+), O(+), O2(+), N, NO, N2O, NO2, O, AND O3. THE CALCULATIONS WERE MADE FOR A 4:1 MIXTURE OF N2 AND O2 AT 1 TORR TOTAL PRESSURE AND 300K. RATE CONSTANTS AS GIVEN BY KENESHEA AND FOWLER (SEE AD-646 975) WERE USED. THE SOLUTIONS ARE PRESENTED AS NUMBER DENSITIES VERSUS TIME AFTER THE START OF THE IRRADIATING ELECTRON BEAM. A DESCRIPTION OF THE MODIFIED CODE IS PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 662 736 7/5
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

PULSE RADIOLYSIS OF AQUEOUS SOLUTIONS, (U)

NOV 67 50P KLEIN,NATHAN ;FANNING,JAMES E. , JR.;WARNER,JOHN W. ;
REPT. NO. NDL-TR-96
PROJ: DA-1N022601A089
TASK: 1N022601A08903

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, SOLUTIONS(MIXTURES)), ELECTRONS, WATER, MOLECULAR ASSOCIATION, X RAYS, PHOTOLYSIS, SODIUM COMPOUNDS, CARBONATES, BARIUM COMPOUNDS, HYDROXIDES, SULFURIC ACID, PERCHLORIC ACID, ABSORPTION SPECTRA (U)
IDENTIFIERS: ELECTRONS, SOLVATES (U)

X-RAY INDUCED AQUEOUS CHEMICAL SPECIES WERE EXAMINED FOR REACTION CHARACTERISTICS AND HOMOGENEOUS DISPERSION. A 3 KRAD, 50 NS, X-RAY PULSE FROM AN ELECTRON ACCELERATOR PRODUCED THE HYDRATED ELECTRON, E(-)AQ, IN SOLUTIONS OF NA2CO3, BA(OH)2, H2SO4, AND HCLO4. KINETIC SPECTROSCOPY WITH NANOSECOND RANGE RESOLVING TIME MEASURED THE OPTICAL ABSORPTION OF E(-)AQ BUT SHOWED NO EVIDENCE OF ANY NONHOMOGENEOUS DISPERSION OF E(-)AQ. THIS INDICATES THAT ANY SPUR LIFETIME OF E(-)AQ IS LESS THAN 1 NS. THE HYDRATED ELECTRON HAS A RAPID, APPARENT SECOND-ORDER DECAY IN AIR-FREE ALKALINE SOLUTIONS DURING THE FIRST HALF MICROSECOND AFTER THE X-RAY PULSE. IT IS PROPOSED THIS DECAY MAY BE DUE TO THE REACTION OF E(-)AQ WITH EITHER H2O(+) OR EXCITED WATER, H2O*. THE DATA ARE SUCH THAT NEITHER POSSIBLE SPECIES CAN BE DISMISSED AS LESS PLAUSIBLE THAN THE OTHER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 664 883 7/5 11/9
AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

PULSE RADIOLYSIS OF POLYSTYRENE, (U)

OCT 67 31P HO,S. K. ;SIEGEL,SEYMOUR ;
SCHWARZ,HAROLD A. ;
REPT. NO. TR-0158(3250-20)-1
CONTRACT: F04695-67-C-0158
MONITOR: SAMSO TR-68-30

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH BROOKHAVEN NATIONAL LAB., UPTON, N. Y.

DESCRIPTORS: (*STYRENE PLASTICS, *RADIATION CHEMISTRY), ELECTRON IRRADIATION, DECOMPOSITION, SOLUTIONS(MIXTURES), AMINES, POLYCYCLIC COMPOUNDS, MOLECULAR ENERGY LEVELS, RELAXATION TIME, FREE RADICALS, TRANSPORT PROPERTIES, ABSORPTION SPECTRA (U)

THE OPTICAL ABSORPTION SPECTRA OF THE TRANSIENT SPECIES PRODUCED BY PULSE ELECTRON RADIOLYSIS OF POLYSTYRENE ARE REPORTED. POLYSTYRENE SAMPLES CONTAINING VARIOUS AROMATIC SOLUTES, AS WELL AS SOLUTE-FREE POLYSTYRENE SAMPLES, WERE EXAMINED. IN SOLUTE-FREE POLYSTYRENE, THE NEGATIVE ION OF POLYSTYRENE IS OBSERVED. HOWEVER, IN SAMPLES CONTAINING TRIPHENYLAMINE AS A SOLUTE, THE SOLUTE POSITIVE ION IS OBSERVED. THE DECAY CONSTANTS OF THE ION POPULATIONS ARE OF THE ORDER OF MILLISECONDS. IN POLYSTYRENE SAMPLES CONTAINING AROMATIC SOLUTES, THE ONLY NEW SPECIES OBSERVED ARE THE CORRESPONDING SOLUTE TRIPLET STATE MOLECULES. ANALYSIS OF THE DATA INDICATES THAT THE ENERGY TRANSFER FROM HOST POLYMER TO SOLUTE OCCURS BY A RANDOM WALK MIGRATION OF SINGLET STATE EXCITATION ENERGY IN THE POLYMER. SOLUTE TRIPLET STATE MOLECULES ARE FORMED BY INTRAMOLECULAR INTERSYSTEM CROSSING IN THE SOLUTE MOLECULE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 669 145 7/5
IIT RESEARCH INST CHICAGO ILL

NATURE OF THE INTERACTION OF SECONDARY ELECTRONS WITH CHEMICAL SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 SEP 61-31 MAR 67,
APR 68 43P FENG,PAUL ;
REPT. NO. IITRI-U-6027-4
CONTRACT: AF 49(638)-1104
PROJ: AF-9760
TASK: 976002
MONITOR: AFOSR 68-0941

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRON IRRADIATION, ORGANIC COMPOUNDS), (*RADIATION CHEMISTRY, ELECTRONS), SPACE ENVIRONMENTS, SECONDARY EMISSION, DAMAGE, RADIATION EFFECTS, ALKANES, MASS SPECTROSCOPY, GAS CHROMATOGRAPHY, PROTON BOMBARDMENT, RECOIL ATOMS, IONIZATION, PROBABILITY (U)
IDENTIFIERS: HEXANES (6 C) (U)

THE PRIMARY EFFORT WAS DIRECTED TOWARD DEVELOPMENT OF THE PROCEDURES AND ACTUAL EXPERIMENTS FOR STUDIES INVOLVING THE INTERACTION OF LOW ENERGY ELECTRONS WITH SIMPLE ORGANIC COMPOUNDS, PRINCIPALLY N-HEXANE. BOTH PHOTOELECTRIC AND THERMIONIC SOURCES WERE USED, THE ELECTRONS WERE ACCELERATED BY MEANS OF ELECTROSTATIC FIELDS BUILT IN THE IRRADIATION VESSEL, AND ANALYSIS OF THE PRODUCTS OBTAINED WAS CARRIED OUT USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY. OTHER EXPERIMENTS WHICH HAVE BEEN PERFORMED INCLUDED IRRADIATION BY LOW ENERGY PROTONS OBTAINED BY SLOWING DOWN HIGHER ENERGY PROTONS FROM A VAN DE GRAAFF GENERATOR, AS WELL AS PRELIMINARY EXPERIMENTS USING THE RECOIL NUCLEI FORMED BY NEUTRON CAPTURE PROCESSES. RESULTS SHOW THAT ALTHOUGH LOW ENERGY ELECTRONS IN THE SUB-KEV RANGE AND PROTONS IN THE NEAR MEV RANGE HAVE COMPARABLE VELOCITIES AND COMPARABLE LET VALUES, THE NATURE OF THE CHEMICAL PROCESSES INDUCED BY THE INTERACTION OF THESE TWO KINDS OF RADIATION MAY NEVERTHELESS DIFFER FROM EACH OTHER. SEVERAL POSSIBLE ALTERNATIVE EXPLANATIONS FOR THIS PHENOMENON HAVE BEEN EXAMINED AND THE MOST PLAUSIBLE ONE APPEARS TO BE A CONCEPT BASED ON IONIC REACTION MECHANISMS FOR SOME OF THE PRODUCTS AND THE RELATIVE TOTAL IONIZATION CROSS SECTIONS OF THESE RADIATIONS AT SUCH ENERGY RANGES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 669 794 7/5 7/4
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

REACTIONS OF THE HYDRATED ELECTRON IN ALKALINE SOLUTION, (U)

MAY 68 12P KLEIN,NATHAN ;TRUMBORE, CONRAD N. ;FANNING,JAMES E. , JR.;WARNER, JOHN W. ;
REPT. NO. NDL-SP-25

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL CHEMISTRY, V72 N3 P880-4 1968.

DESCRIPTORS: (*COMPLEX COMPOUNDS, *ELECTRONS), (*RADIATION CHEMISTRY, SOLUTIONS(MIXTURES)), HYDRATES, ABSORPTION SPECTRA, BASES(CHEMISTRY), SODIUM COMPOUNDS, CARBONATES, BARIUM COMPOUNDS, HYDROXIDES, SULFURIC ACID, PERCHLORIC ACID, WATER, MOLECULAR ASSOCIATION (U)
IDENTIFIERS: BARIUM HYDROXIDE, SODIUM CARBONATE, *ELECTRONS, *SOLVATES (U)

AN INVESTIGATION OF CHEMICAL REACTIONS TAKING PLACE IN AQUEOUS SOLUTIONS DURING AND IMMEDIATELY AFTER AN X-RADIATION PULSE WAS CARRIED OUT. EQUIPMENT WITH RESOLVING TIME IN THE NANOSECOND RANGE WAS ASSEMBLED TO MEASURE OPTICAL ABSORPTION AS A FUNCTION OF TIME USING 6328-A LIGHT. THE HYDRATED ELECTRON, EAQ(-), WAS PRODUCED IN SOLUTIONS OF NA2CO3, BA(OH)2, H2SO4, AND HCLO4 BY A 3-KRAD, 50-NSEC X-RAY PULSE FROM AN ELECTRON ACCELERATOR. NO EVIDENCE FOR NONHOMOGENEOUS DISTRIBUTION OF EAQ(-) WAS OBTAINED IN THE TIME FRAME INVESTIGATED. IN AIR-FREE ALKALINE SOLUTION, AN EXTREMELY RAPID DECAY OF THE EAQ(-) ADSORPTION WAS OBSERVED. THIS DECAY IS OBSERVED FOR APPROXIMATELY 0.5 MICROSEC AFTER AN X-RAY PULSE. THE VERY FAST DISAPPEARANCE IS QUENCHED WHEN THE SOLUTIONS CONTAIN AN EXCESS OF STRUCTURE-BREAKING IONS OVER STRUCTURE MAKERS. IT IS POSTULATED THAT THE OBSERVED DECAY IS DUE TO REACTION OF EAQ(-) WITH H2O*. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 674 072 7/5 11/9
NATIONAL BUREAU OF STANDARDS WASHINGTON D C

RADIATION-INDUCED COPOLYMERIZATION OF TETRAFLUOROETHYLENE AND 3,3,3-TRIFLUOROPROPENE UNDER PRESSURE, (U)

SEP 67 15P BROWN,DANIEL W. ;WALL,LEO A. ;
PROJ: DA-20014501B13B
MONITOR: AROD 2703:6

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF POLYMER SCIENCE, PT. A-1, V6 P1367-1379 1968.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 31 JUL 67.

DESCRIPTORS: (*RADIATION CHEMISTRY, *COPOLYMERIZATION), (*HALOGENATATED HYDROCARBONS, COPOLYMERIZATION), FLUORINE COMPOUNDS, ETHYLENES, PROPENES, GAMMA RAYS, REACTION KINETICS, MOLECULAR WEIGHT, HALOCARBON PLASTICS, SYNTHESIS(CHEMISTRY), PHYSICAL PROPERTIES (U)
IDENTIFIERS: ETHYLENE/TETRAFLUORO, PROPENE/3-3-3-TRIFLUORO (U)

A STUDY WAS MADE OF THE GAMMA-RAY-INDUCED COPOLYMERIZATION OF TETRAFLUOROETHYLENE AND 3,3,3-TRIFLUOROPROPENE. COPOLYMERIZATIONS WERE CARRIED OUT AT 100C AND 5000 ATM. PRESSURE AND AT 21C AND VARIOUS PRESSURES UP TO 8000 ATM. THE REACTIVITY RATIOS CALCULATED FROM THE COMPOSITION DATA INDICATE THAT THE PROPAGATION RATE CONSTANTS FAVOR ADDITION OF TRIFLUOROPROPYLENE BY A FACTOR OF 3-7; INDIVIDUAL VALUES DEPENDED LITTLE ON THE POLYMERIZATION PRESSURE AND TEMPERATURE. POLYMERIZATION RATES CHANGED LITTLE WITH MONOMER COMPOSITION BETWEEN 0 AND 75% TETRAFLUOROETHYLENE; BETWEEN 75 AND 95% TETRAFLUOROETHYLENE THEY INCREASED BY A FACTOR OF 10. AS MANY AS 850,000 MOLECULES WERE POLYMERIZED PER 100 E.V. ABSORBED. THE COPOLYMERS ARE SOLUBLE IN HEXAFLUOROBENZENE AT 29.6C IF THEY CONTAIN LESS THAN 70% TETRAFLUOROETHYLENE. INTRINSIC VISCOSITIES RANGE FROM 0.1 TO ABOUT 10 DL./G. FROM VARIOUS CONSIDERATIONS IT APPEARS LIKELY THAT THE DEGREE OF POLYMERIZATION IS ABOUT EQUAL TO THE KINETIC CHAIN LENGTH IN HIGH-PRESSURE POLYMERIZATIONS AT 21C; AT AUTOGENOUS PRESSURE OR AT 5000 ATM AND 100C, MONOMER TRANSFER REDUCES THE VALUE CONSIDERABLY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 675 757 7/5
FRANKFORD ARSENAL PHILADELPHIA PA

PHOTOLYSIS AND RADIOLYSIS OF PROPARGYL BROMIDE, (U)

DEC 63 9P TRACHTMAN,M. ;
REPT. NO. FA-A64-34
PROJ: DA-1-T-061102-B-13-A

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V68 N6 P1415-1419 JUN 64.

DESCRIPTORS: (*ALKYNES, *RADIATION CHEMISTRY), HALOGENATED HYDROCARBONS, BROMINE COMPOUNDS, PHOTOLYSIS, FREE RADICALS, CHEMICAL BONDS (U)
IDENTIFIERS: RADIOLYSIS (U)

THE RADIATION AND PHOTOCHEMISTRY OF PROPARGYL BROMIDE IN THE LIQUID PHASE WAS STUDIED IN THE PRESENCE AND ABSENCE OF FREE-RADICAL SCAVENGERS AT 25C. THE GASEOUS PRODUCTS FROM RADIOLYSIS WERE HYDROGEN, ACETYLENE, AND METHYLACETYLENE, WHEREAS ONLY METHYLACETYLENE WAS OBSERVED IN PHOTOLYSIS. THE FAILURE OF OXYGEN AND DIPHENYLPICRYLHYDRAZYL TO INHIBIT ACETYLENE FORMATION WAS ATTRIBUTED TO ITS FORMATION VIA AN ION-MOLECULE REACTION SUGGESTED BY A STUDY OF THE PRESSURE DEPENDENCE OF THE MASS SPECTRUM OF PROPARGYL BROMIDE. THE DATA DO NOT PERMIT ANY CONCLUSIONS REGARDING THE EXTENT OF FORMATION OF ACETYLENE VIA HOT RADICAL AND EXCITED MOLECULE REACTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 675 920 20/13 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ACADEMY OF SCIENCES OF THE BELORUSSIAN SSR. NEWS. SERIES IN THE PHYSICAL AND TECHNICAL SCIENCES, NO. 4, 1966 (SELECTED ARTICLES), (U)

AUG 67 63P KRASIN,B. A. ;LITVENENKO, A. K. ;GALITSEISKII,E. M. ;DANILOU,YU I. ; KALININ,E. K. ;
REPT. NO. FTD-HT-23-892-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF AKADEMIYA NAVUK BSSR, MINSK. VESTSI. SERYYA FIZIKA-TEKHNICHNYKH NAVUK, N4 P5-11, 32-55, 138 1966, BY E. HARTER.

DESCRIPTORS: (*NUCLEAR REACTORS, USSR), (*RADIATION CHEMISTRY, REPORTS), HEAT TRANSFER, TRANSIENTS, BORON, NUCLEAR REACTORS, INTENSITY, NUCLEAR RADIATION, MATHEMATICAL ANALYSIS, GAS FLOW, NEUTRON FLUX, HYDRODYNAMICS, THERMODYNAMICS (U)
IDENTIFIERS: TRANSLATIONS (U)

CONTENTS: CALCULATION OF THE RADIATION INTENSITY OF THE BORON-CONTAINING RADIATION ELEMENT OF THE IRT-2000 LOOP UNIT; CONVECTIVE HEAT EXCHANGE IN A TUBE WITH PULSATIONS OF THE GASEOUS HEAT CARRIER WITH A FREQUENCY CORRESPONDING TO THE SECOND RESONANCE HARMONIC; UNSTEADY CONVECTIVE HEAT EXCHANGE AND HYDRODYNAMICS IN CHANNELS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 676 655 7/5 8/4 20/12
KANSAS UNIV LAWRENCE DEPT OF GEOLOGY

RADIATION DAMAGE AND CHEMICAL REACTIONS INDUCED IN CRYSTALLINE SOLIDS BY HIGH-ENERGY PROTON BOMBARDMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 FEB 67-1 APR 68, SEP 68 25P ZELLER,EDWARD J. ; DRESCHHOFF,GISELA ;
CONTRACT: F19628-67-C-0182
PROJ: AF-8602
TASK: 860202
MONITOR: AFCRL 68-0350

UNCLASSIFIED REPORT

DESCRIPTORS: (*CRYSTALS, *DAMAGE), (*RADIATION CHEMISTRY, CRYSTALS), DIAMONDS, GRAPHITE, SILICON CARBIDES, GLASS, PROTON BOMBARDMENT, DEUTERON BOMBARDMENT, ALPHA BOMBARDMENT, ORGANIC COMPOUNDS, SYNTHESIS(CHEMISTRY), COSMIC RAYS, SOLAR RADIATION, (U)SOLAR RADIATION (U)
IDENTIFIERS: TEKTITES (U)

THE OBJECTIVES OF THE RESEARCH SUMMARIZED IN THE REPORT WERE TWOFOLD. FIRST, AN EFFORT WAS MADE TO DETERMINE WHETHER HEAVY PARTICLE IRRADIATION COULD PRODUCE SIGNIFICANT CHANGES IN THE INFRARED ABSORPTION CHARACTERISTICS OF VARIOUS SUBSTANCES. SECOND, AFTER HAVING OBSERVED THAT SUBSTANTIAL CHANGES WERE PRODUCED, AN ATTEMPT WAS MADE TO DETEPMINE THE NATURE OF THE DEFECTS OR REACTION PRODUCTS. IRRADIATIONS WERE PERFORMED UNDER A VARIETY OF CONDITIONS AND PROTONS, DEUTERONS AND ALPHA PARTICLES WERE USED. ENERGIES RANGED FROM 0.7 MEV TO 1.8 MEV. TARGET MATERIALS WERE DIAMOND, GRAPHITE, SILICON CARBIDE, AND TEKTITE GLASS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 676 919 7/5
FRANKFORD ARSENAL PHILADELPHIA PA

EFFECT OF DENSITY ON THE RADIOLYSIS OF PROPYLENE. (U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH ARTICLE,
66 10P TRACHTMAN,M. ;
REPT. NO. FA-A66-20
PROJ: DA-1-T-061102-B-13-A

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V70 P3382-3388 1966.

DESCRIPTORS: (*PROPENES, *RADIATION CHEMISTRY), DENSITY, THERMODYNAMICS, OXYGEN, HYDROGEN, METHANE, CATALYSIS, MOLECULAR WEIGHT, MIXTURES, LIQUEFIED GASES (U)

THE RADIOLYSIS OF PROPYLENE WAS STUDIED AT VARIOUS TEMPERATURES BOTH BELOW AND ABOVE THE CRITICAL TEMPERATURE AS A FUNCTION OF DENSITY. THE YIELDS OF BOTH H2 AND CH4 DECREASED WITH INCREASING DENSITY AT ALL TEMPERATURES. THE MOST STRIKING FEATURE OF THE DATA IS THE APPARENT CONSTANCY OF THE YIELD OF H2 AND CH4 IN THE TWO-PHASE REGION. THERE ALSO APPEARS TO BE A DENSITY-INDEPENDENT REGION ABOVE THE CRITICAL TEMPERATURE. PROPYLENE WAS IRRADIATED IN THE PRESENCE OF 02 AND THE RESULTS SHOW THAT IN THE GAS PHASE THE YIELDS OF H2 AND CH4 WERE SHARPLY DECREASED. IN THE TWO-PHASE REGION THE INHIBITORY EFFECT OF 02 IS MARKEDLY DECREASED FOR BOTH H2 AND CH4. MIXTURES OF PROPYLENE AND PROPYLENE-D SUB 6, AT VARIOUS DENSITIES, WERE IRRADIATED IN THE PRESENCE AND ABSENCE OF SCAVENGER. HIGHER MOLECULAR WEIGHT PRODUCTS WERE ALSO MEASURED AS A FUNCTION OF DENSITY, AND LIKE H2 AND CH4 WERE ALSO FOUND TO DECREASE WITH INCREASING DENSITY IN THE DENSITY RANGE 0.01 TO 0.07 G/CC. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 677 504 7/5 7/4
DUKE UNIV DURHAM N C DEPT OF PHYSICS

ELECTRON SPIN RESONANCE OF AN IRRADIATED SINGLE CRYSTAL OF DEOXYADENOSINE MONOHYDRATE, (U)

APR 68 8P LICHTER, JAMES J. ; GORDY, WALTER ;

CONTRACT: AF-AFOSR-493-66
PROJ: AF-9767
TASK: 976702
MONITOR: AFOSR 68-2236

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, V60 N2 P450-455 JUN 68.

DESCRIPTORS: (*ELECTRON PARAMAGNETIC RESONANCE, RADIATION EFFECTS), (*RADIATION CHEMISTRY, *FREE RADICALS), CRYSTALS, ADDITION REACTIONS, RIBOSE, CARBOHYDRATES, ADENINE, DEUTERIUM (U)

A SINGLE CRYSTAL OF DEOXYADENOSINE MONOHYDRATE GROWN FROM D20 HAS BEEN GAMMA-IRRADIATED AND OBSERVED AT ROOM TEMPERATURE WITH AN X-BAND ESR SPECTROMETER. TWO STABLE FREE RADICALS WERE EVIDENT, ONE FORMED BY H-ADDITION ON THE ADENINE BASE AND THE OTHER APPARENTLY FORMED BY LOSS OF AN H FROM THE DEOXYRIBOSE SUGAR. STUDY HAS BEEN CONCENTRATED ON THE FORMER. CALCULATIONS INDICATE THAT H ADDITION IS POSSIBLE ON EITHER C(2) OR C(8) OF THE BASE RING. OUR SPECTRA INDICATE THAT C(2) IS THE ACTUAL SITE OF THE ADDITION. THE OBSERVED (14)N NUCLEAR COUPLING INDICATES ELECTRON SPIN DENSITIES OF 0.37 ON N(3) AND OF 0.17 ON N(1) - IN GOOD AGREEMENT WITH THEORETICALLY PREDICTED VALUES OF 0.38 AND 0.12 FOR A RADICAL FORMED BY H ADDITION ON C(2). THE ISOTROPIC HYPERCONJUGATIVE COUPLING TO EACH OF THE C(2)H2 METHYLENE PROTONS IS 43.7 PLUS OR MINUS 0.5 G. THE NITROGEN COUPLING IS ALSO AXIALLY SYMMETRIC, VARYING FROM APPROXIMATELY 0 TO 20 G FOR N(3) AND FROM APPROXIMATELY 0 TO 8 G FOR N(1). (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 678 032 7/5
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

RADIOLYSIS OF NEUTRAL AQUEOUS SOLUTIONS OF CYSTEINE IN THE PRESENCE OF OXYGEN, (U)

MAY 68 4P PACKER,J. E. ;WINCHESTER, R. V. ;
CONTRACT: AF-AFOSR-950-65
PROJ: AF-9760
TASK: 976002
MONITOR: AFOSR 68-2519

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL COMMUNICATIONS, P826-827 1968.

DESCRIPTORS: (*RADIATION CHEMISTRY, PROTEINS), (*PROTEINS, *FREE RADICALS), SOLUTIONS(MIXTURES), OXY(U)
IDENTIFIERS: CYSTEINE, FREE RADICAL SCAVENGERS, RADIOLYSIS (U)

RESULTS ARE PRESENTED AND DISCUSSED ON THE RADIOLYSIS OF OXYGENATED, NEUTRAL AQUEOUS SOLUTIONS OF CYSTEINE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 680 136 7/5 6/1
CALIFORNIA INST OF TECH PASADENA GATES AND CRELLIN LABS OF CHEMISTRY

CORRELATION BETWEEN PHOTOCHEMISTRY AND HIGH-ENERGY RADIATION CHEMISTRY, (U)

DEC 68 11P HAMMOND,GEORGE S. ;CALDWELL, RICHARD A. ;KING,JOHN M. ;KRISTINSSON,HAUKUR ;WHITTEN,DAVID G. ;
CONTRACT: AF 49(638)-1479
PROJ: AF-9762
TASK: 976201
MONITOR: AFOSR 68-2854

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN PHOTOCHEMISTRY AND PHOTOBIOLOGY, V7 N6 P695-703 1968.

DESCRIPTORS: (*RADIATION CHEMISTRY, SOLUTIONS(MIXTURES)), (*PHOTOCHEMICAL REACTIONS, SOLUTIONS(MIXTURES)), GAMMA RAYS, FREE RADICALS, IONS, PHOTOLYSIS, ALKENES, REACTION KINETICS, MOLECULAR ISOMERISM, MOLECULAR ORBITALS (U)
IDENTIFIERS: FREE RADICAL SCAVENGERS, STILBENES (U)

THE INITIAL INTERACTIONS BETWEEN HIGH-ENERGY RADIATION AND A SAMPLE OF CONDENSED MATTER ARE COMPLEX. HOWEVER, SOON AFTER THE INITIAL PHASES THE EXCITATION ENERGY APPEARS IN WELL-KNOWN FORMS: IONS, FREE RADICALS, AND MOLECULAR EXCITED STATES. THESE EXCITED SPECIES ARE THE IMMEDIATE PRECURSORS OF THE STABLE CHEMICAL PRODUCTS. THE NATURE OF THE CHEMICALLY SIGNIFICANT EXCITED SPECIES CAN BE INFERRED BY STUDYING THE CHEMICAL CHANGES INDUCED IN SOLUTES WHICH HAVE BEEN WELL CHARACTERIZED IN PHOTOCHEMICAL STUDIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 682 674 6/1 7/5 6/18
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIATION BIOLOGY

X- AND GAMMA-IRRADIATION OF DILUTE SOLUTIONS OF CHYMOTRYPSIN; THE ACTIVE INTERMEDIATE, (U)

JUN 68 9P LYNN,K. R. ;ORPEN,GAIL ;
MONITOR: NRC 10411

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN INT. J. RADIAT. BIOL., V14 N4 P363-371 1968. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 11 MAR 68.

DESCRIPTORS: (*RADIATION CHEMISTRY, CHYMOTRYPSIN), (*CHYMOTRYPSIN, *ULTRAVIOLET SPECTRA), X RAYS, GAMMA RAYS, SOLUTIONS(MIXTURES), HYDROCHLORIC ACID, ENZYMES, REACTION KINETICS, ACETONES, GLUCOSE, ETHANOLS, PROPANOLS, FREE RADICALS, HYDROXIDES, CANADA, (U)CANADA (U)

X- AND GAMMA-IRRADIATION OF DILUTE AQUEOUS SOLUTIONS OF CHYMOTRYPSIN IN 0.001 M HCL OR IN WATER PRODUCE DIFFERENCE SPECTRA, OVER THE RANGE 210-330 M MICRONS, QUALITATIVELY SIMILAR TO THAT OBTAINED ON REACTION OF THE ENZYME WITH HYDROXYL RADICALS FROM FENTON'S REAGENT. THE PROTECTION OF THE ESTEROLYTIC PROPERTIES OF CHYMOTRYPSIN AGAINST IRRADIATION WAS MEASURED USING BTEE AS THE SUBSTRATE AND SODIUM FORMATE, ACETONE, GLUCOSE, ETHANOL AND ISO-PROPANOL AS PROTECTORS. THE RESULTS OBTAINED, WHEN COMBINED WITH ABSOLUTE RATE CONSTANTS AVAILABLE FOR REACTIONS OF THE HYDROXYL RADICAL, SHOW THAT RADICAL TO BE THE PREDOMINANT REACTIVE SPECIES IN THE IRRADIATION OF DILUTE AQUEOUS SOLUTIONS OF THE ENZYME. (AUTHOR) (U)

AD-A047 350 DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA F/G 7/5
RADIATION CHEMISTRY.(U)
NOV 77
UNCLASSIFIED DDC/BIB-77/13 NL

2 OF 3
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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 683 277 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DETECTION OF A CAPTURED ELECTRON IN IRRADIATED FROZEN AQUEOUS SOLUTIONS OF ALKALIS BY THE ELECTRON PARAMAGNETIC RESONANCE METHOD, (U)

FEB 68 14P ERSHCHOV,B. G. ;PIKAEV,A. K. ;
REPT. NO. FTD-MT-24-10-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF RADIATSIONNAYA FIZIKA (USSR) V4 N4 P39-47 1966.

DESCRIPTORS: (*RADIATION CHEMISTRY, ELECTRON CAPTURE), (*ELECTRON CAPTURE, SOLUTIONS(MIXTURES)), ALKALI METAL COMPOUNDS, PARAMAGNETIC RESONANCE, IONIZATION, PHOTOLYSIS, LINE SPECTRA, ICE, SODIUM COMPOUNDS, NITRATES, POTASSIUM COMPOUNDS, HYDROXIDES, USSR (U)
IDENTIFIERS: HYDRATED ELECTRONS, POLARONS, POTASSIUM HYDROXIDE, SODIUM NITRATES, SODIUM NITRATES, TRANSLATIONS (U)

IN EARLIER WORK THE HYDRATED ELECTRON PRODUCED BY THE EFFECT OF IONIZING RADIATION ON WATER WAS DETECTED WITH THE AID OF EPR. THE PRESENT STUDY WAS MADE ON FROZEN SOLUTIONS, FOR WHICH THE PROBABILITY OF THE HYDRATED ELECTRON IS THE LARGEST. THE EPR SOLUTIONS OF NANO3 IRRADIATED AT 77K, AND OF CONCENTRATED SOLUTIONS OF KOH, IRRADIATED AT 77K, ARE ANALYZED AND THE RADICALS RESPONSIBLE FOR THE DIFFERENT FINE STRUCTURE LINES ARE IDENTIFIED. THE MEASURED LINE WIDTHS AND THE CORRESPONDING G-FACTORS, AS WELL AS DATA OBTAINED BY OTHERS, LEAD TO THE CONCLUSION THAT IN THE RADIOLYSIS OF WATER AND AQUEOUS SOLUTIONS, THE PRIMARY RADIOLYSIS PRODUCT, WHICH HAS REDUCING PROPERTIES, IS THE HYDRATED ELECTRON, WHICH BECOMES STABILIZED IN ALKALINE SOLUTIONS AT LOW TEMPERATURES. THE CHARACTER OF ITS EPR SPECTRUM INDICATES THAT THE NEAREST NEIGHBORING OF THE ELECTRON ARE WATER MOLECULES AND NOT CATIONS. THE NATURE OF THE OBSERVED PARAMAGNETIC CENTER IS DISCUSSED IN LIGHT OF THESE RESULTS AND PUBLISHED DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 683 493 7/4
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

KINETIC STUDIES OF THE HYDRATED ELECTRON. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 69 34P KLEIN,NATHAN ;FANNING,JAMES
E. , JR.;SMITH,THOMAS L. ;GEPHART,HARRY N.
;
REPT. NO. NDL-TR-120
PROJ: DA-1-B-062104-A-089
TASK: 1-B-062104-A-08903

UNCLASSIFIED REPORT

DESCRIPTORS: (*WATER, *RADIATION CHEMISTRY),
(*ELECTRONS, SOLUTIONS(MIXTURES)), REACTION KINETICS, X
RAYS, ELECTROMAGNETIC PULSES, BASES(CHEMISTRY),
DIFFUSION (U)
IDENTIFIERS: ELECTRONS, SOLVATES (U)

THE ULTRA-FAST, SECOND-ORDER DECAY OF THE HYDRATED ELECTRON, E(AQ)(-), FIRST OBSERVED FOLLOWING NANOSECOND X-RAY PULSES IN AIR-FREE, ALKALINE SOLUTION, HAS BEEN STUDIED IN GREATER DETAIL. THE ADDITION OF ALKALI HALIDE SALTS IN LOW CONCENTRATION STRONGLY INFLUENCES THE KINETIC BEHAVIOR OF THE REACTION, AND IT IS SUGGESTED THAT E(AQ)(-) REACTS WITH A POSITIVE ION, TENTATIVELY ASSIGNED THE FORMULA H2O(+). THE EFFECT OF STRUCTURE ON REACTIVITY IS DISCUSSED AND METHODS OF CHARGE TRANSFER AND ENERGY MIGRATION IN SOLUTION ARE REVIEWED. THE POSSIBLE EXISTENCE OF A WANNIER EXCITON IN THESE SOLUTIONS IS SUGGESTED.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 683 534 7/5 11/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

INVESTIGATION OF THE EFFECT OF GAMMA-RADIATION ON THE PROCESS OF OXIDATION OF POLYETHYLENE AS DETERMINED BY INFRARED SPECTROSCOPY, (U)

NOV 68 10P NARZULLAEV,B. N. ;KORODENKO, G. D. ;KARIMOV,S. N. ;MARUPOV,P. ;
REPT. NO. FTD-HT-23-1103-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF AKADEMIYA NAUK TADZHIKSKOI SSR, DUSHANBE. DOKLADY, V10 N3 P21-24 1967, BY D. KOOLBECK.

DESCRIPTORS: (*POLYETHYLENE PLASTICS, *RADIATION CHEMISTRY), GAMMA RAYS, OXIDATION, USSR, FREE RADICALS, INFRARED SPECTROSCOPY (U)
IDENTIFIERS: TRANSLATIONS (U)

POLYETHYLENE 100 MICRONS THICK WAS IRRADIATED USING A 60CO SOURCE TO A DOSE OF 10 TO THE 5TH POWER TO 4 X 10 TO THE 8TH POWER RADS. THE SAMPLE WAS KEPT UNDER VACUUM FOR 20 DAYS AND EXPOSED TO THE AIR FOR 5 DAYS. THE IR SPECTRUM WAS DETD. AND ANALYZED, AND GRAPHICAL REPRESENTATIONS ILLUSTRATING THE DEPENDENCE OF THE OPTICAL DENSITY OF THE BANDS AT 1720, 1465, 1375, AND 965/CM ON THE DOSE ARE SHOWN. A MECHANISM TO ACCOUNT FOR THE PROCESSES OF DEGRADA[illegible] AND LOSS OF CRYSTALLINITY IS SUGGESTED. (AUTHOR)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOMO7

AD- 684 378 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ALL-UNION CONFERENCE ON THE APPLICATION OF RADIOACTIVE AND STABLE ISOTOPES AND RADIATION IN THE NATIONAL ECONOMY AND SCIENCE. ISOTOPES AND RADIATION IN CHEMISTRY. TRANSACTIONS. 1957 (SELECTED ARTICLES). (U)

NOV 68 94P
REPT. NO. FTD-HT-23-688-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF MONO. VSESOYUZNAYA KONFERENTSIYA PO PRIMENENIYU RADIOAKTIVNYKH I STABILNYKH IZOTOPOV I IZLUCHENII V NARODNOM KHOZYAISTVE I NAUKE. IZOTOPY I IZLUCHENIYA V KHIMII, 1957 TRUDY, MOSCOW, 1958 P85-140.

DESCRIPTORS: (*RADIATION CHEMISTRY, SYMPOSIA), IONIZATION, SOLUTIONS(MIXTURES), URANIUM COMPOUNDS, ALPHA PARTICLES, GAMMA RAYS, OXIDATION, POLYMERS, BROMINE, WATER, POLYMERIZATION, USSR, RADIOACTIVE ISOTOPES, STABLE ISOTOPES (U)
IDENTIFIERS: PENTANE, TRANSLATIONS (U)

THE RADIATION CROSSLINKING OF POLYETHYLENE, POLYMETHYLSILOXANE AND OTHER POLYMERS WAS STUDIED. THE STUDIES ON THE MECHANISM OF CROSSLINKING OF POLYETHYLENE INDICATE THAT THE CROSSLINKING PROCESS TAKES PLACE MAINLY AS A RESULT OF THE SIMULTANEOUS DETACHMENT OF TWO HYDROGEN ATOMS IN NEIGHBORING MOLECULES AS A RESULT OF SINGLE PRIMARY EVENT. THE STUDY OF THE IRRADIATED POLYMETHYLSILOXANE HAS SHOWN THAT THE PART OF THE POLYMER WHICH CRYSTALLIZES AT -40-50C DECREASES IN PROPORTION TO THE RADIATION DOSE. A COMPARATIVE STUDY OF THE PROCESS OF RADIATION VULCANIZATION OF NATURAL AND SYNTHETIC RUBBER WAS MADE. IT WAS SHOWN THAT CERTAIN ADDITIVES RETARD RADIATION VULCANIZATION, WHILE OTHERS ACCELERATE IT SOMEWHAT. (AUTHOR, MODIFIED-PL) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 684 437 7/5 13/2
NAVAL RESEARCH LAB WASHINGTON D C

THE INTERACTION OF RADON DECAY PRODUCTS WITH AEROSOLS. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,
DEC 68 26P SAUNDERS,A. W. , JR.;
PATTERSON,R. L. , JR.;LOCKHART,L. B. , JR;

REPT. NO. NRL-6802
PROJ: RR-001-05-42-4851

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR POLLUTION, *AEROSOLS), (*RADIATION CHEMISTRY, AEROSOLS), RADON, RADIOACTIVE DECAY, PHTHALATES (U)
IDENTIFIERS: DOP, PHTHALATE/DIOCTYL, SMOG (U)

AN INSTRUMENTED PLASTIC CHAMBER WAS CONSTRUCTED AND USED TO STUDY THE STABILITY OF SOME SUBMICRON DIOCTYL PHTHALATE (D.O.P.) AEROSOLS AND THEIR INTERACTION WITH THE SHORT-LIVED RADIOACTIVE DECAY PRODUCTS OF RADON (222RN). THE DEGREE OF ATTACHMENT OF THE RADON DECAY PRODUCTS TO THE D.O.P. AEROSOLS IN THIS CHAMBER HAS BEEN SHOWN TO BE A FUNCTION OF THE RELATIVE AREAS OF THE AEROSOL AND WALL SURFACES. AT HIGH AEROSOL CONCENTRATIONS (100,000 PARTICLES/CU CM), 90% OR MORE OF THE SHORT-LIVED DECAY PRODUCTS ARE ATTACHED TO AEROSOL PARTICLES. AT LOWER AEROSOL CONCENTRATIONS AND PARTICULARLY WHEN CONVECTION INCREASES THE AVAILABILITY OF THE WALLS FOR DEPOSITION, THE AIRBORNE RADIOACTIVITY IS MUCH LESS. UNDER THE PROPER CONDITIONS APPRECIABLE QUANTITIES OF UNATTACHED RADON DESCENDANTS WILL REMAIN AIRBORNE. A FEW PRELIMINARY STUDIES WITH THESE 'FREE' ATOMS OR SIMPLE MOLECULES HAVE SHOWN THAT THEY ARE EFFECTIVELY RETAINED BY FIBROUS FILTERS. THEY THUS PROVIDE A USEFUL TOOL FOR EVALUATING THE RETENTIVITY OF FILTER MEDIA TOWARD EXTREMELY SMALL PARTICLES AND FOR STUDYING THE MECHANISM OF PARTICLE CAPTURE THROUGH DIFFUSIVE PROCESSES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 684 487 7/5 11/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

NEW FIBER-FORMING POLYAMIDES, (U)

MAR 69 10P FEDOTOVA,O. YA. ;SHTILMAN, M. I. ;KOLESNIKOV,G. S. ;
REPT. NO. FSTC-HT-23-665-68
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF KHIMICHESKIE VOLOKNA (USSR) V10 P5-7 1968.

DESCRIPTORS: (*POLYAMIDE PLASTICS, *SYNTHETIC FIBERS), (*RADIATION CHEMISTRY, POLYAMIDE PLASTICS), SYNTHESIS(CHEMISTRY), GAMMA RAYS, CARBOXYLIC ACIDS, DIENES, AMINES, HYDROCARBONS, ETHYLENEDIAMINE, USSR (U)
IDENTIFIERS: POLYAMIDE FIBERS (U)

POLYAMIDES HAVE BEEN OBTAINED IN YIELDS OF 92-95% FROM THE UNSATURATED 6-DODECENE-1, 12-DICARBOXYLIC AND 6, 10-HEXADECADIENE DICARBOXYLIC ACID SETHYLENE DIAMINE, HEXAMETHYLENE DIAMINE AND DECAMETHYLENE DIAMINE. THE POLYAMIDE FROM 6-DODECENE-1, 12-DICARBOXYLIC ACID AND HEXAMETHYLENE DIAMINE YIELDS FIBER WHICH AFTER IRRADIATION WITH GAMMA RAYS FROM CO-60 AT A DOSE RATE OF 2.7 MRAD/HR., SHOWED A BREAKING STRENGTH OF UP TO 33.1 RKM AND AN ELONGATION OF 23%, COMPARED WITH VALUES OF 20.3 RKM AND 25% FOR THE UNIRRADIATED FIBER. (AUTHOR-PL) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 685 099 7/5 7/3
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

IONIC REACTIONS IN ETHYL CHLORIDE, (U)

JAN 68 34P TIERNAN, THOMAS O. ; HUGHES, B. MASON ;
REPT. NO. ARL-68-0195
PROJ: AF-7023
TASK: 702300

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ADVANCES IN CHEMISTRY SERIES, N82 P412-440 1968.

DESCRIPTORS: (*HALOGENATED HYDROCARBONS, *IONIZATION), (*RADIATION CHEMISTRY, HALOGENATED HYDROCARBONS), (*PHOTOLYSIS, HALOGENATED HYDROCARBONS), MASS SPECTROSCOPY (U)
IDENTIFIERS: *ETHYL CHLORIDE, ETHANE, ION MOLECULE INTERACTIONS, RADIOLYSIS (U)

ION-MOLECULE REACTIONS IN GASEOUS ETHYL CHLORIDE ARE IDENTIFIED BY DETAILED MASS SPECTROMETRIC INVESTIGATION. THE MAJORITY OF THESE REACTIONS LEAD ULTIMATELY TO A SINGLE UNREACTIVE IONIC PRODUCT, C4H10CL+, WHICH CONSTITUTES ABOUT 70% OF THE TOTAL IONIC YIELD AT A SYSTEM PRESSURE OF 1000 MICRONS. FROM THE RADIOLYSIS PRODUCTS OF ETHYL CHLORIDE AND OF ETHYL CHLORIDE WITH VARIOUS ADDITIVES, THE IONIC FRAGMENTATION SCHEME IS DEDUCED AT THE HIGHER PRESSURES USED. ION-SCAVENGING TECHNIQUES ARE USED TO CHARACTERIZE UNREACTIVE IONS IN THE RADIOLYSIS SYSTEM. THE PRODUCT DISTRIBUTION RESULTING FROM EXCITED ETHYL CHLORIDE MOLECULE DECOMPOSITION IS DERIVED FROM RELATED PHOTOLYSIS STUDIES AND IS USED IN CONJUNCTION WITH DATA OBTAINED FOR THE OTHER REACTION PROCESSES TO CONSTRUCT A COMPLETE MECHANISM FOR THE RADIOLYTIC DECOMPOSITION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 685 359 7/5 7/4
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

INTRAMOLECULAR ELECTROSTATIC ELECTRON TRAPS, (U)

SEP 68 6P MITTAL,JAI P. ;LIBBY,W. F. ;

CONTRACT: AF-AFOSR-245-65
PROJ: AF-9710
TASK: 971003
MONITOR: AFOSR 69-0859TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN NATURE, V220 N5171 P1027-1028, 7 DEC 68.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 19 AUG 68.

DESCRIPTORS: (*HALOGENATED HYDROCARBONS, *ELECTRON CAPTURE), (*RADIATION CHEMISTRY, *ELECTRONS), FLUORINE COMPOUNDS, FURANS, GAMMA RAYS, CYCLOBUTANES, CYCLOHEXANES, CYCLOOCTANES (U)
IDENTIFIERS: CYCLOHEXANE/DODECAFLUORO, CYCLOBUTANE/OCTAFLUORO, ELECTRON TRAPS, FLUORINE ORGANIC COMPOUNDS (U)

CYCLIC FLUOROCARBONS ARE SHOWN TO CAPTURE LOW ENERGY ELECTRONS READILY WHILE THE ANALOGOUS STRAIGHT CHAIN COMPOUNDS DO NOT. IT IS SUGGESTED THAT THE CAUSE IS AN ELECTROSTATIC POTENTIAL WELL IN THE CYCLIC COMPOUNDS WHICH IS MADE BY THE NEGATIVE FLUORINES WHICH CANNOT EXIST IN THE STRAIGHT CHAINS SINCE THEY DO NOT CLOSE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 685 402 6/18 6/1 7/5
ARMY BIOLOGICAL LABS FREDERICK MD

APPLICATION OF THE HIGH-FREQUENCY ELECTRICAL CONDUCTIVITY METHOD FOR THE STUDY OF ADSORPTION PROPERTIES OF IRRADIATED PROTEINS, (U)

69 9P TKACH,V. K. ;FRENKEL,L. A. ;
REPT. NO. TRANS-2411

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF UNIDENTIFIED RUSSIAN LANGUAGE ARTICLE, P824-829, N.D.

DESCRIPTORS: (*PROTEINS, ADSORPTION), (*RADIATION CHEMISTRY, PROTEINS), ELECTRICAL CONDUCTIVITY, SOLUTIONS(MIXTURES), DESIGN, SENSITIVITY, ELECTRIC FIELDS, IONS, CIRCUITS, DIAGRAMS, RADIATION EFFECTS, RADIATION DOSAGE, BLOOD PROTEINS, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

THE METHOD DEVISED BY THE AUTHOR MAKES IT POSSIBLE TO ESTIMATE THE ADSORPTIVE PROPERTIES OF PROTEINS BY DETERMINING THE TEMPERATURE COEFFICIENTS OF THE HIGH-FREQUENCY ELECTRICAL CONDUCTIVITY OF THEIR SOLUTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 687 654 7/5 6/1
DEFENSE RESEARCH ESTABLISHMENT OTTAWA (ONTARIO)

GAMMA-RADIOLYSIS OF DISULFIDES IN AQUEOUS SOLUTION. II. D-PENICILLAMINE DISULFIDE, (U)

JUL 68 9P PURDIE,J. W. ;
REPT. NO. DREO-572

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CANADIAN JNL. OF CHEMISTRY, V47 N6 P1029-1036 1969. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: PRESENTED AT ANNUAL MEETING OF RADIATION RESEARCH SOCIETY (15TH), SAN JUAN, PUERTO RICO, MAY 67. SEE ALSO AD-687 655.

DESCRIPTORS: (*SULFIDES, *RADIATION CHEMISTRY), FREE RADICALS, AMINO ACIDS, ORGANIC SULFUR COMPOUNDS, CANA(U)
IDENTIFIERS: CYSTEINE SULFUR COMPLEXES, DISULFIDE LINKAGES, MERCAPTANS, NITROGEN OXIDE(N2O), PENICILLAMINE SULFUR COMPLEXES, RADICAL SCAVENGERS, RADIOLYSIS (U)

THE GAMMA-RADIOLYSIS OF D-PENICILLAMINE DISULFIDE (PENSSPEN) IN AN AQUEOUS SOLUTION HAS BEEN STUDIED UNDER AERATED AND DEAERATED CONDITIONS. G VALUES WERE DETERMINED FOR THE FOLLOWING PRODUCTS: PENICILLAMINE SULFINIC ACID (PENSO2H), PENICILLAMINIC ACID (PENSO3H), BETA-HYDROXYVALINE (PENOH), 2-AMINO-3-METHYLBUT-3-ENOIC ACID (HOOC.CH(NH2).C(CH3)=CH2), PENICILLAMINE (PENSH), PENICILLAMINE DISULFIDE-S-MONOXIDE (PENS(O)SPEN), VALINE (PENH), PENICILLAMINE TRISULFIDE (PENSSSPEN), AND AMMONIA. THE LOW YIELD OF PENSO3H IN AERATED SOLUTION INDICATED THAT PENSOH DID NOT REACT WITH OXYGEN OR O2(-). EXPERIMENTS WITH OH RADICALS PRODUCED CHEMICALLY (TICL3/H2O2) AND IRRADIATIONS WITH CYSTEINE OR PENICILLAMINE PRESENT WERE USED TO CONFIRM THESE REACTIONS. THESE AND THE OTHER REACTIONS WERE TESTED WITH RADICAL SCAVENGERS; FORMATE AND MONOCHLOROACETATE IONS AND NITROUS OXIDE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 687 756 7/4 7/5 11/9
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

SOME ASPECTS OF KINETICS OF SOLID PHASE POLYMERIZATION, (U)

APR 69 16P KABANOV,V. A. ;PANISOV,P. M. ;KARGIN,V. A. ;
REPT. NO. FSTC-HT-23-279-68
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE SOEDINENIYA (USSR) V8 N9 P1627-1634 1966.

DESCRIPTORS: (*POLYMERIZATION, *CRYSTALS), (*RADIATION CHEMISTRY, POLYMERIZATION), REACTION KINETICS (U)
IDENTIFIERS: TRANSLATIONS (U)

SOLID PHASE POLYMERIZATION IS CONSIDERED AS A NONEQUILIBRIUM PHASE TRANSFORMATION: CRYSTALLINE MONOMER - POLYMER. AN EXPRESSION IS OBTAINED FOR THE DIMENSION OF THE CRYSTALLINE SEED OF THE POLYMER PHASE WITH THE ASSUMPTION THAT IT REPRESENTS MACROMOLECULES WHICH ARE PACKED IN PARALLEL. THE NOTION WAS PUT FORTH THAT THE S-SHAPED FORM OF THE KINETIC CURVES OF SOLID PHASE POLYMERIZATION IS CONNECTED WITH THE SLOW GENERATION AND FOLLOWING RAPID DEVELOPMENT OF THE POLYMER PHASE. THE HYPOTHESIS WAS PUT FORTH THAT UNDER THE INFLUENCE OF RADIATIONS OF HIGH ENERGY ON THE CRYSTALLAINE MONOMER, 'HOT' AREAS ARE CREATED IN THE CRYSTALLINE MONOMER IN WHICH POLYMER CHAINS MAY CONTINUE TO GROW AND AND WHICH WILL TURN OUT TO BE THERMODYNAMICALLY UNSTABLE WHEN THESE 'HOT' AREAS ARE 'COOLED'; A FURTHER EFFECT OF RADIATION MAY BE CAUSED BY THE CHAIN DECAY OF THESE UNSTABLE MOLECULES TO THE MONOMER STATE. IT WAS SHOWN THAT THE FORMATION OF THERMODYNAMICALLY UNSTABLE CHAINS IN THE CRYSTAL OF THE MONOMER, ACCOMPANYING THEIR FORMATION BY 'ANNEALING' AND THEN BY 'USUAL' POLYMERIZATION, MAY BE IN A NUMBER OF CASES THE REASON FOR THE COMPLICATED CHARACTER OF THE KINETICS OF SOLID PHASE POLYMERIZATION UNDER THE EFFECT OF RADIATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 690 948 7/5 7/3
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POLYMER PRODUCTION IN THE GAMMA RADIOLYSIS OF METHANE IN LIQUID ARGON, (U)

SEP 68 5P HAMLET,PETER ;MOSS,JEFFREY ; MITTAL,JAI P. ;LIBBY,W. F. ;
CONTRACT: AF-AFOSR-1255-67
PROJ: AF-9538
MONITOR: AFOSR 69-1814TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF THE AMERICAN CHEMICAL SOCIETY, V91 N[illegible] P258-260, 15 JAN 69.

DESCRIPTORS: (*METHANE, *RADIATION CHEMISTRY), (*POLYMERIZATION, METHANE), SOLIDIFIED GASES, GAMMA RAYS, POLYMERS (U)
IDENTIFIERS: AUGER ELECTRONS, RADIOLYSIS (U)

GAMMA RADIOLYSIS OF METHANE PRODUCES A POLYMER WHICH IN THE CONDENSED PHASE HAS AN AVERAGE MOLECULAR FORMULA C20H40. AN ATTEMPT TO STUDY THE MECHANISM WAS MADE BY USING THE IONIZATION CAUSED BY ELECTRON TRANSFER FROM METHANE TO ARGON IONS IN LIQUID ARGON. THE GAMMA RADIOLYSIS OF LIQUID ARGON-METHANE SOLUTIONS SHOWED THAT IN MIXTURES CONTAINING AS LITTLE AS 0.15 MOLE % METHANE, A POLYMER AVERAGING C22H42 WAS PRODUCED WITH A G VALUE 11 TIMES THAT FOR THE POLYMER FROM PURE METHANE. THIS G VALUE IS CALCULATED ON TOTAL ENERGY ABSORBED BY THE SAMPLE. IT IS SUGGESTED THAT THE POLYMER IS FORMED BY CONDENSATION OF THE DENSE BLOB OF METHANE FRAGMENTS WHICH COULD BE FORMED BY AUGER ELECTRONS EMITTED FOLLOWING INNER-SHELL IONIZATION. THIS IONIZATION WOULD BE HIGHLY LOCALIZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 691 138 7/5 20/12
NORTH CAROLINA STATE UNIV RALEIGH PHYSICAL SCIENCE RESEARCH

EFFECTS OF 60CO GAMMA IRRADIATION UPON YVO4, YVO4:EU(3+), AND YVO4:NO(3+). (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 69 79P SMITH,BENNETT MICHAEL ;
CONTRACT: DAAH01-67-C-1456

UNCLASSIFIED REPORT

DESCRIPTORS: (*YTTRIUM COMPOUNDS, *FLUORESCENCE), (*RADIATION CHEMISTRY, YTTRIUM COMPOUNDS), (*VANADATES, FLUORESCENCE), DOPING, GAMMA RAYS, SINGLE CRYSTALS, EUROPIUM, IONIZATION, ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, MOLECULAR ENERGY LEVELS, CRYSTAL DEFECTS, NEODYMIUM (U)
IDENTIFIERS: GAMMA RAYS, IRRADIATION, HOLES(ELECTRON DEFICIENCIES), YTTRIUM VANADATE (U)

THE ABSORPTION AND FLUORESCENT SPECTRA OF SINGLE CRYSTALS OF YVO4, YVO4:EU(3+) ARE DISCUSSED AND ILLUSTRATED, AND THE EFFECTS OF 60CO GAMMA IRRADIATION UPON THE SPECTRA ARE PRESENTED. IRRADIATION PRODUCED SIMILAR CHANGES IN THE ABSORPTION COEFFICIENT OF THESE CRYSTALS. SMALL CENTER BANDS WERE FORMED IN THE ULTRAVIOLET AND VISIBLE REGIONS. THE INTENSITY OF THE FLUORESCENT EMISSION FORM BOTH YVO4 AND YVO4:EU(3+) WAS DECREASED BY IRRADIATION, WHILE THE EMISSION INTENSITY OF YVO4:ND(3+) WAS NOT AFFECTED. SPECULATIONS ABOUT THE NATURE OF THE MECHANISMS PRODUCING THE IRRADIATION EFFECTS DISCUSSED. GAMMA IRRADIATION PRODUCES IONIZATION IN CRYSTALS, AND SOME OF THE FREE ELECTRONS AND HOLES CREATED BECOME TRAPPED AT LATTICE DEFECTS. THE CHANGES IN EMISSION AND ABSORPTION IN THE YVO4 CRYSTALS ARE INTERPRETED AS DUE TO THE TRAPPED HOLES AND ELECTRONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 691 327 7/5 18/4
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

HYDROGEN AND HYDROGEN PEROXIDE PRODUCED BY GAMMA RADIOLYSIS OF OXYGEN-SATURATED WATER, (U)

JUN 69 38P SASSE,RONALD A. ;
REPT. NO. NDL-TR-122
PROJ: DA-1-B-062104-A-089
TASK: 1-B-062104-A-08903

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION MEASURING INSTRUMENTS, WATER), (*WATER, *RADIATION CHEMISTRY), (*HYDROGEN PEROXIDE, RADIATION CHEMISTRY), DAMAGE, RADIATION EFFECTS, HYDROGEN, IONIZATION, GAMMA RAYS, OXYGEN (U)
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, RADIOLYSIS (U)

PURE, OXYGEN-SATURATED WATER WAS IRRADIATED WITH 60CO GAMMA RADIATION. AT LOW DOSES, G(H202) WAS 2.6. AT DOSES GREATER THAN 2000 RAD, G(H202) WAS 1.33. OVER THE ENTIRE DOSE INTERVAL G(H2) WAS CONSTANT AT 0.17. THE G VALUES OF 1.33 AND 0.17 AGREE WITH PUBLISHED DATA. MANY EXPERIMENTS ARE PRESENTED TO FORM THE ARGUMENT THAT G(H202) = 2.6 IS NOT THE RESULT OF AN IMPURITY REACTION AND THAT THIS VALUE IS THE INITIAL YIELD. THIS HIGH G VALUE WAS MEASURED BY TWO DIFFERENT PURIFICATION PROCEDURES. THE RESULTS ARE COMPARED WITH THE PRESENTLY ACCEPTED MECHANISM FOR THE RADIOLYSIS OF OXYGEN-SATURATED WATER AND THE CONCLUSION IS REACHED THAT THIS MECHANISM IS IN ERROR AT LEAST IN THE LOW DOSE RANGE. ANOTHER MECHANISM IS DEVELOPED TO ACCOUNT FOR THE EXPERIMENTAL RESULTS WHERE H2O(+) AND E(-) ARE PROPOSED AS THE PRIMARY SPECIES IN THE RADIOLYSIS OF WATER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 106 7/5
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC CHEMISTRY

ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: FINAL REPT. OCT 64-APR 69, MAY 69 37P SWAN,G. A. ;FAYADH,J. M.
;
CONTRACT: AF 61(052)-773
PROJ: AF-7360
TASK: 736003
MONITOR: AFML TR-69-137

UNCLASSIFIED REPORT

DESCRIPTORS: (*AMINES, *RADIATION CHEMISTRY), (*PHOTOLYSIS, AMINES), (*QUINOLINES, RADIATION CHEMISTRY), GAMMA RAYS, IONS, FREE RADICALS, NUCLEAR MAGNETIC RESONANCE, ALKENES, PIPERIDINES, PEROXIDES, NITROGEN HETEROCYCLIC COMPOUNDS, SYNTHESIS(CHEMISTRY), GREAT BRITAIN (U)
IDENTIFIERS: ANILINE/N-N-DIMETHYL, *ANILINES, QUINOLINEMETHANOL ANTIMALARIALS, QUINOLINE-3-4-DICARBOXIMIDE COMPOUNDS, *RADIOLYSIS, TERTIARY AMINES (U)

GAMMA-RADIOLYSIS OF PURE NN-DIMETHYLANILINE YIELDS NN'-DIMETHYL-NN'-DIPHENYLETHYLENEDIAMINE (THROUGH DIMERISATION OF THE N-METHYLANILINOMETHYL RADICAL) TOGETHER WITH HYDROGEN, METHANE, AND N-METHYLANILINE; BUT WHEN THE RADIOLYSIS IS CARRIED OUT IN THE PRESENCE OF ACID THE FIRST NAMED PRODUCT IS REPLACED BY N-P-DIMETHYLAMINOBENZYL-N-METHYLANILINE AND/OR 4,4'-BISDIMETHYLAMINODIPHENYLMETHANE, FORMED VIA THE ION (PHNME:CH2)+. THE TWO LATTER PRODUCTS ARE ALSO FORMED BY PHOTOLYSIS OF THE AMINE IN THE PRESENCE OF ACID. GAMMA-RADIOLYSIS OF NN-DIMETHYL-P-TOLUIDINE GIVES NN'-DIMETHYL-NN'-DI-P-TOLYLETHYLENEDIAMINE AND 4,4'-BISDIMETHYLAMINOBIBENZYL. GAMMA-IRRADIATION OR PHOTOLYSIS OF NN-DIMETHYLANILINE IN THE PRESENCE OF N-PHENYLMALEIMIDE YIELDS 1,2,3,4-TETRAHYDRO-1-METHYLQUINOLINE-3,4-DICARBOXYLIC-N-PHENYLIMIDE, THROUGH A RADICAL REACTION. A SIMILAR REACTION OCCURS WITH OTHER NN-DIALKYLANILINES, N-PHENYLPYRROLIDINE, OR N-PHENYLPIPERIDINE IN THE PRESENCE OF OLEFINIC COMPOUNDS SUCH AS N-PHENYLMALEIMIDE, DIETHYL MALEATE, CYCLOHEXENE, OR CYCLOPENTENE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 455 7/4
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

TEMPERATURE DEPENDENCE OF THE ELECTRON SPIN RESONANCE SPECTRUM OF THE CH2C02 (-) RADICAL FORMED IN X-IRRADIATED ZINC ACETATE DIHYDRATE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 69 134P HUNT, JOHN WOODROW ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACETATES, *ELECTRON PARAMAGNETIC RESONANCE), (*RADIATION CHEMISTRY, ELECTRON PARAMAGNETIC RESONANCE), X RAYS, FREE RADICALS, THESES (U)
IDENTIFIERS: CARBON CARBON BONDING, METHYLENE RADICALS, ZINC ACETATE (U)

A DECREASE OF ONE TO SIX GAUSS (DEPENDING ON MAGNETIC FIELD ORIENTATION) IN THE COUPLING CONSTANTS OF THE CH2C02(-) RADICAL FORMED IN X-IRRADIATED ZINC ACETATE DIHYDRATE HAS BEEN OBSERVED OVER A TEMPERATURE RANGE OF ABOUT -60C TO +30C. CALCULATIONS OF DIPOLAR AND FERMI CONTACT INTERACTION BASED ON A MODEL OF INTERNAL ROTATION OF THE METHYLENE GROUP ABOUT THE C-C BOND HAVE SHOWN A SMALL COUPLING CONSTANT DECREASE ON THE ORDER OF 0.19 GAUSS OVER A TEMPERATURE RANGE OF -150C TO +90C. THE MAJOR EFFECT HAS BEEN SHOWN TO BE DUE TO A SPIN RELAXATION MECHANISM. THE EFFECT WAS CALCULATED USING MONTE CARLO TECHNIQUES, THE RESULTS OF WHICH WERE CONFIRMED BY EXPERIMENTAL DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 671 7/5 11/9
COLUMBIA UNIV NEW YORK DEPT OF CHEMICAL ENGINEERING

DIFFUSIONAL EFFECTS IN RADIATION-INDUCED GRAFT POLYMERIZATION, (U)

67 19P ODIAN,GEORGE ;KRUSE,ROBERT L. ;
CONTRACT: DA-ARO(D)-31-124-G716
MONITOR: AROD 5764:1-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. POLYMER SCI., P1-13 N.D.
SUPPLEMENTARY NOTE: PRESENTED AT THE INTERNATIONAL SYMPOSIUM ON MACROMOLECULAR CHEMISTRY, BRUSSELS, JUN 67.

DESCRIPTORS: (*RADIATION CHEMISTRY, *COPOLYMERIZATION), (*STYRENES, COPOLYMERIZATION), (*ACRYLONITRILE POLYMERS, COPOLYMERIZATION), POLYMERIZATION, POLYETHYLENE PLASTICS, DIFFUSION, MATHEMATICAL ANALYSIS, FILMS, GAMMA RAYS (U)
IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COPOLYMERS, *GRAFT POLYMERIZATION, STYRENE COPOLYMERS (U)

VARIOUS THEORETICAL EQUATIONS HAVE BEEN DERIVED TO SHOW THE EFFECTS OF DIFFUSION ON STEADY-STATE RADIATION-INDUCED GRAFT POLYMERIZATION. THE THEORETICAL RELATIONSHIPS DESCRIBE THE EFFECTS OF DIFFUSION ON THE GRAFTING REACTION IN TERMS OF THE CHANGE IN THE REACTION FROM VOLUMETRIC TO SURFACE GRAFTING, THE EFFECT OF POLYMER FILM THICKNESS ON THE RATE OF GRAFTING AND THE ORDER OF THE DEPENDENCE OF THE RATE ON THE RADIATION INTENSITY. A MATHEMATICAL ANALYSIS IS PRESENTED IN TERMS OF THE QUANTITATIVE INTERRELATIONSHIPS OF THE QUANTITIES, I (THE RADIATION INTENSITY), D (THE DIFFUSIVITY OF THE MONOMER IN THE POLYMER), AND L(THE POLYMER FILM THICKNESS). THE THEORETICAL EQUATIONS SHOW THE EXACT MANNER IN WHICH THESE QUANTITIES INTERACT TO DETERMINE THE GRAFTING RATE. EXPERIMENTAL DATA ARE PRESENTED FOR THE GRAFT POLYMERIZATION OF STYRENE-ACRYLONITRILE TO HIGH DENSITY POLYETHYLENE FILMS OF 1.1 TO 40 MILS THICKNESS AT DOSE RATES FROM 0.005 TO 8.5 MRADS/HR. THE EXPERIMENTAL RESULTS ARE SHOWN TO CONFIRM THE THEORETICAL RELATIONSHIPS QUITE WELL. THE UTILITY OF THESE PLOTS IS DISCUSSED AS IS THE APPLICABILITY OF THE DERIVED THEORETICAL RELATIONSHIPS TO ALL GRAFTING SYSTEMS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 673 7/5 11/9
COLUMBIA UNIV NEW YORK DEPT OF CHEMICAL ENGINEERING

MONOMER REACTIVITY RATIOS IN RADIATION GRAFT COPOLYMERIZATION, (U)

68 8P ODIAN,GEORGE ;KRUSE,ROBERT L. ;
CONTRACT: DA-ARO(D)-124-G716
MONITOR: AROD 5764:3-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN POLYMER PREPRINTS, V9 N1 P668-674 APR 68.

DESCRIPTORS: (*RADIATION CHEMISTRY, *COPOLYMERIZATION), (*STYRENES, COPOLYMERIZATION), (*ACRYLONITRILE POLYMERS, COPOLYMERIZATION), GAMMA RAYS, POLYMERIZATION, FREE RADICALS, POLYETHYLENE PLASTICS (U)
IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COPOLYMERS, *GRAFT POLYMERIZATION, RADIOLYSIS (U)

THE PAPER CONCERNS THE GAMMA RADIATION-INITIATED GRAFT COPOLYMERIZATION OF VARIOUS PAIRS OF MONOMERS TO SEVERAL DIFFERENT POLYMERS. THE AUTHORS HAVE REEXAMINED MANY OF THE GRAFTING SYSTEMS WHICH HAVE BEEN REPORTED TO SHOW ANOMALOUS BEHAVIOR AND HAVE STUDIES A NUMBER OF NEW POLYMER-COMONOMER MIXTURE SYSTEMS. PARTICULAR EMPHASIS WAS PLACED ON A STUDY OF THE PHYSICAL NATURE OF THE MEDIA IN WHICH THE GRAFTING REACTION TAKES PLACE. ALMOST ALL OF THE PREVIOUS WORK INVOLVED POLMER FILMS WHICH WERE INSOLUBLE IN THE MONOMERS ALTHOUGH IN MOST INSTANCES THE POLYMERS WERE SWOLLEN BY THE MONOMERS. IT WAS THOUGHT THAT THE HETEROGENEITY AND/OR HIGHLY VISCOUS NATURE OF THESE SYSTEMS MIGHT HAVE CAUSED THE ANOMALOUS COPOLYMERICATION BEHAVIOR. GRAFTING SYSTEMS COMPOSED OF POLYMER SOLUTIONS, HIGHLY VISCOUS POLYMER-MONOMER MIXTURES AND INSOLUBLE POLYMER FILMS IMMERSED IN LIQUID MONOMERS WERE STUDIED. THE LATTER INCLUDES BOTH POLYMERS SWOLLEN BY MONOMER AND POLYMERS NOT SWOLLEN BY MONOMERS. FURTHER, EMPHASIS WAS PLACED ON THE ANALYTIC METHODS. ALL OF THE PREVIOUSLY REPORTED WORK INVOLVED ANALYSIS OF ONLY ONE COMPONENT IN THE GRAFTED COPOLYMER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 693 299 7/5 7/3 11/9
COLUMBIA UNIV NEW YORK

...ATION EFFECTS IN POLYMERIC SYSTEMS. (U)

...OTE: FINAL REPT. 1 NOV 65-31 OCT 68,
... 5P ODIAN,GEORGE ;
CON... A-ARO(D)-31-124-G716
MONITOR: AROD 5764:5-C

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, *POLYMERIZATION), COPOLYMERIZATION, CROSSLINKING(CHEMISTRY), DIFFUSION, POLYETHYLENE PLASTICS, STYRENE PLASTICS, ACETONITRILE(U)
IDENTIFIERS: *GRAFT POLYMERIZATION (U)

THE INVESTIGATION OF RADIATION INDUCED POLYMERIZATION AND CROSSLINKING IN POLYETHYLENE/ STYRENE-ACRYLONITRILE AND POLYTETRAFLUOROETHYLENE/ STYRENE- ACRYLONITRILE SYSTEMS IS BRIEFLY OUTLINED. ALTERATIONS IN MONOMER REACTIVITIES IN GRAFT POLYMERIZATIONS AND THE INTERACTION OF DIFFUSION AND GRAFT POLYMERIZATION WERE STUDIED. (AUTHOR, MODIFIED-PL) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 693 419 7/5 11/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

POLYMERIZATION OF N, N'-DIALLYL AMIDES IN THE SOLID PHASE, (U)

JUN 69 6P SHCHERBINA,F. F. ;FEDOROVA, I. P. ;
REPT. NO. FTD-HT-23-1104-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF AKADEMIYA NAUK URSR, KIEV. DOPOVIDI. SERIYA B. GEOLOGIYA, GEOFIZYKA, KHIMIYA TA BIOLOGIYA, V29 N7 P639-641 1967.

DESCRIPTORS: (*POLYMERIZATION, *AMIDES), (*RADIATION CHEMISTRY, POLYMERIZATION), (*POLYAMIDE PLASTICS, SYNTHESIS(CHEMISTRY)), FREE RADICALS, GAMMA RAYS, USS(U)
IDENTIFIERS: TRANSLATIONS (U)

N, N-DIALLYLAMIDES OF DICARBOXYLIC ACIDS WERE POLYMD. IN THE SOLID STATE AT ROOM TEMP. AND UNDER CO IRRADN. (1060 RADS/SEC.) ALIPHATIC AMIDES POLYMERIZED FASTER THAN AROMATIC AMIDES. THUS POLYAMIDES OF N, N-DIALLYLAMIDES OF OXALIC, MALONIC, SUCCINIC, GLUTARIC, ADIPIC, SEBACIC, AND ETHYLMALONIC ACIDS WERE OBTAINED IN 86-96% YIELDS AND PHTHALIC, ISOPHTHALIC, AND TEREPHTHALIC ACIDS IN 41-72% YIELDS. WITH THE EXCEPTION OF POLY(N, N-DIALLYLOXALAMIDE) WHICH WAS PINK, THE PREPARED ALIPHATIC POLYAMIDES WERE YELLOW, AND THE AROMATIC POLYAMIDES WERE RED-VIOLET. BY SUBSEQUENT IRRADIATION OF YELLOW CRYSTALLINE POLY (N, N'-DIALLYLMALONAMIDE) THE POLYMER BECAME BLUE, APPARENTLY, DUE TO THE PRESENCE OF FREE RADICALS, WHICH DECAYED WITH TIME. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 693 643 11/10
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

THE THERMAL STABILITY OF PHENYL CONTAINING SILICONE RUBBERS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 69 19P KAY,EDNA ;
REPT. NO. RAE-TR-69025

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, *CROSSLINKING(CHEMISTRY)), (*SILICONES, CROSSLINKING(CHEMISTRY)), (*PEROXIDES, CROSSLINKING(CHEMISTRY)), (*VULCANIZATION, SILICONES), ELASTOMERS, THERMAL STABILITY, GAMMA RAYS, OXIDATION, STRESSES, VULCANIZATES, GREAT BRITAIN (U)
IDENTIFIERS: METHYL VINYL SILICONE RUBBER, PEROXIDE/ BIS(1'-1'-DIMETHYLBENZYL), *SILICONES, *SYNTHETIC RUBBER, STRESS RELAXATION TESTS (U)

A COMPARISON HAS BEEN MADE BETWEEN THE THERMAL STABILITIES OF PHENYL METHYL SILICONE RUBBERS CROSS-LINKED BY ORGANIC PEROXIDES AND BY HIGH ENERGY IRRADIATION. THE LARGE QUANTITIES OF PEROXIDE REQUIRED TO PRODUCE PRACTICAL LEVELS OF CURE, LEAD TO REACTIONS DETRIMENTAL TO HEAT STABILITY AND THE RESULTING VULCANISATES OFFER NO ADVANTAGES OVER PEROXIDE-CURED METHYL VINYL POLYMERS. SUCH UNDESIRABLE EFFECTS CAN BE ELIMINATED BY THE USE OF IRRADIATION, WHICH, COMBINED WITH THE SUPERIOR OXIDATION RESISTANCE PROVIDED BY THE PHENYL GROUPS PRODUCESS AN ELASTOMER OF OUTSTANDING HEAT STABILITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 693 834 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION-INDUCED POLYMERIZATION OF HEXAFLUOROPROPYLENE, (U)

JAN 69 8P SKOBINA,A. I. ;VOLKOVA,E. V. ;

REPT. NO. FTD-HT-23-851-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF SIMPOZIUM. RADIATSIONNAYA KHIMIYA POLIMEROV, MOSCOW, 1964. MATERIALY (SYMPOSIUM ON RADIATION INDUCED POLYMERS, MOSCOW, 1964. MATERIALS) MOSCOW, 1966 P126-128.

DESCRIPTORS: (*RADIATION CHEMISTRY, *POLYMERIZATION), (*PROPENES, POLYMERIZATION), (*HALOGENATED HYDROCARBONS, POLYMERIZATION), FLUORINE COMPOUNDS, FREE RADICALS, GAMMA RAYS, REACTION KINETICS, USSR (U)
IDENTIFIERS: PROPYLENE HEXAFLUORIDE, *RADIOLYSIS, TRANSLATIONS (U)

THE CORRELATIONS IN THE RADIATION-INDUCED POLYMERIZATION OF HEXAFLUOROPROPYLENE CANNOT BE EXPLAINED ON THE BASIS OF THE ORDINARY CONCEPTS OF THE DEVELOPMENT OF THE PROCESS IN ACCORDANCE WITH THE RADICAL OR IONIC MECHANISM AND REQUIRE FURTHER STUDY. IT IS POSSIBLE THAT THE KEY ROLE IN THE POLYMERIZATION OF HEXAFLUOROPROPYLENE IS PLAYED BY THE RETARDATION OF THE PROCESS BY THE RESULTING POLYMERIZATION PRODUCTS AND BY THE PRODUCTS OF THEIR RADIOLYSIS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 694 416 7/5 11/9
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

RADIATION POLYMERIZATION OF OLIGO(ETHYLENEGLYCOL-MALEATE-ADIPATE) WITH VARIOUS MONOMERS, (U)

SEP 69 12P OMELCHENKO,S. I. ;VIDENINA, N. G. ;CHERVETSOVA,I. N. ;
REPT. NO. FSTC-HT-23-380-69
PROJ: FSTC-9701020, FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM KHIMICHNA PROMYSLOVIST (USSR) N2 1968.

DESCRIPTORS: (*COPOLYMERIZATION, *RADIATION CHEMISTRY), (*POLYESTER PLASTICS, COPOLYMERIZATION), VINYL PLASTICS, ACRYLIC RESINS, STYRENE PLASTICS, GAMMA RAYS, INFRARED SPECTRA, MECHANICAL PROPERTIES, USSR (U)
IDENTIFIERS: ADIPIC ACID, *COPOLYMERS, ETHYLENE GLYCOL, MALEIC ACID, *OLIGOMERS, TRANSLATIONS (U)

RADIATION COPOLYMERIZATION OF OLIGO(ETHYLENEGLYCOL-MALEATE-ADIPATE) WITH MONOMERS OF VARIOUS STRUCTURES HAS BEEN STUDIED. IT HAS BEEN SHOWN THAT FOR RADIATION COPOLYMERIZATION WITH OMAD, MONOMERS CAN BE ARRANGED IN A SERIES ACCORDING TO REACTION CAPABILITY. THE CROSS-LINKING REACTION UNDER THE INFLUENCE OF -RADIATION PROCEEDS MORE COMPLETELY THAN IN THE PRESENCE OF PEROXIDE INDICATORS. THIS IS CONFIRMED BY DATA FROM IR-SPECTRA, RESULTS OF DETERMINATION OF THE GEL-FRACTION CONTENT AND SPECIFIC VOLUME OF THE CONTRACTION OF THE COPOLYMERS. PHYSICO-MECHANICAL INDICES, THERMOSTABILITY AND WATER-RESISTANCE IN ALL RADIATION COPOLYMERS STUDIED IS HIGHER THAN IN SIMILAR COPOLYMERS OBTAINED BY THE THERMO-CHEMICAL METHOD. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 696 728 7/5 7/2
SHELL DEVELOPMENT CO EMERYVILLE CALIF

LOW-TEMPERATURE RADIATION CHEMISTRY I. PREPARATION OF OXYGEN FLUORIDES AND DIOXYGENYL TETRAFLUOROBORATE, (U)

JAN 69 10P WAGNER,CHARLES D. ; GOETSCHEL,CHARLES T. ;CAMPANILE,VINCENT A. ; WILSON,J. NORTON ;
CONTRACT: DA-31-124-ARO(D)-54
MONITOR: AROD 4133:27-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF THE AMERICAN CHEMICAL SOCIETY, V91 N17 P4702-4707, 12 AUG 69.

DESCRIPTORS: (*OXYGEN COMPOUNDS, SYNTHESIS(CHEMISTRY)), (*FLUOBORATES, OXYGEN COMPOUNDS), (*RADIATION CHEMISTRY, OXYGEN COMPOUNDS), FLUORIDES, FLUORINE, OXYGEN, CHEMICAL PROPERTIES, PHYSICAL PROPERTIES, BORON COMPOUNDS, COMPLEX COMPOUNDS (U)
IDENTIFIERS: BORON TRIFLUORIDE, DIOXYGENYL TETRAFLUOROBORATE, FLUORINE PEROXIDE, *RADIOLYSIS (U)

RADIOLYSIS OF LIQUID MIXTURES OF O2 AND F2 AT 77K WITH 3-MEV BREMSSTRAHLUNG PRODUCES A MIXTURE OF O2F2 AND (O2F)N WITH POSSIBLY SMALL AMOUNTS OF HIGHER OXIDES. THE MIXTURE WAS CONVERTED TO PURE O2F2 AT 195K. CONTRARY TO EARLIER REPORTS, PURE O2F2 IS YELLOW, MELTS SHARPLY AT 119K, AND IS DIAMAGNETIC. INFRARED SPECTRA WERE OBTAINED OF THE UNPURIFIED PRODUCT AND OF O2F2. IN THE RADIOLYTIC SYNTHESIS, THE G VALUE FOR GENERATION OF F ATOMS APPEARS TO BE ABOUT 20. DATA SUPPORT THE EXISTENCE OF O2F2, O2F, O4F2, AND UNKNOWN OXIDES OF HIGHER OXYGEN CONTENT. AS PREVIOUSLY REPORTED BY OTHERS, BF3 REACTS WITH EITHER O2F2 OR WITH MIXTURES OF O2F2 AND SUPEROXYGEN FLUORIDES TO PRODUCE O2BF4; LESS STABLE COMPOUNDS SEEM TO BE PRODUCED FROM THE HIGHER SUPEROXIDES. THE INFRARED AND PARAMAGNETIC RESONANCE SPECTRA OF O2BF4 HAVE BEEN OBTAINED; THE X-RAY POWDER PATTERN SHOWS THAT THE CRYSTALS ARE ORTHORHOMBIC AND ISOMORPHOUS WITH NOBF4. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 698 051 7/5 11/9
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF LOCKHEED RESEARCH LAB

ESR SPECTRA OF ORIENTED POLYTETRAFLUOROETHYLENE SUBJECTED TO 20-NSEC PULSES OF ELECTRONS, (U)

MAR 68 9P LERNER,N. R. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V50 N7 P2902-2910, 1 APR 69. NO COPIES FURNISHED.

DESCRIPTORS: (*HALOCARBON PLASTICS, *ELECTRON PARAMAGNETIC RESONANCE), (*ELECTRON IRRADIATION, HALOCARBON PLASTICS), (*RADIATION CHEMISTRY, HALOCARBON PLASTICS), DEGRADATION, FREE RADICALS, FLUORINE COMPOUNDS, OXIDATION, OXYGEN (U)
IDENTIFIERS: FLUORINATED POLYMERS, *TETRAFLUOROETHYLENE RESINS (U)

SAMPLES OF ORIENTED POLYTETRAFLUOROETHYLENE HAVE BEEN SUBJECTED TO IRRADIATION FROM A PULSED ELECTRON BEAM GENERATOR. THE DURATION OF THE PULSES WAS 20 NSEC, AND DOSES RANGING FROM 0.8-14 MRAD WERE DELIVERED TO THE SAMPLES. WORKING WITH ORIENTED SAMPLES MAKES IT POSSIBLE TO DISTINGUISH AND IDENTIFY TWO DISTINCT SPECIES IN THE SAMPLES IRRADIATED IN AIR. THE RELATIVE CONCENTRATION OF THE TWO SPECIES VARIES AS A FUNCTION OF THE DOSE. IN SAMPLES RECEIVING LARGER DOSES OF RADIATION THE SPECIES -CF2-(CF-O-O)-CF2-DOMINATES THE ESR SPECTRUM. AT LOWER DOSES THE SPECIES -CF2-O-O. MAKES A LARGER RELATIVE CONTRIBUTION TO THE ESR SPECTRUM. SAMPLES WERE ALSO SUBJECTED TO IRRADIATION IN VACUUM. THE ESR SPECTRA OBTAINED FROM THE VACUUM-IRRADIATED SAMPLES BEFORE AND AFTER THE ADMISSION OF AIR IS DISCUSSED. SAMPLES WERE SUBJECTED (IN AIR) TO RADIATION FROM A 60CO SOURCE, RANGING FROM 5-30 MRAD, AT A DOSE RATE OF 0.43 MRAD/H. THE SPECIES -CF2-O-O. DOMINATES THE ESR SPECTRUM OF 60CO IRRADIATED SAMPLES. THE DETAILS OF THE LINE SHAPES OF THE ESR SPECTRA OF SAMPLES IRRADIATED IN AIR ARE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 698 432 7/5
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

RADIATION-INDUCED DIMERIZATION OF 1,3-CYCLOHEXADIENE. SOLVENT EFFECTS AND THE FORMATION OF THE DIELS-ALDER DIMERS BY A CATIONIC CHAIN MECHANISM, (U)

OCT 68 6P SCHUTTE,R. ;FREEMAN,G. R.
;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF THE AMERICAN CHEMICAL SOCIETY, V91 N14 P3715-3720, 2 JUL 69. NO COPIES FURNISHED.

DESCRIPTORS: (*RADIATION CHEMISTRY, *POLYMERIZATION), (*DIENES, RADIATION CHEMISTRIES), CYCLOALKENES, DIENE SYNTHESIS, ADDITION REACTIONS, MOLECULAR ISOMERISM, MOLECULAR ORBITALS (U)
IDENTIFIERS: CHAIN REACTIONS, CHEMICAL REACTION MECHANISMS, *CYCLOHEXADIENE COMPOUNDS, *RADIOLYSIS, TRIPLET ENERGY LEVELS (U)

THE RADIATION-INDUCED DIMERIZATION OF 1,3-CYCLOHEXADIENE OCCURRED BY TWO SIMULTANEOUS MECHANISMS: MECHANISM 1 PRODUCED MAINLY THE ENDO AND EXO DIELS-ALDER PRODUCTS OF 1,4,1',2' ADDITION; MECHANISM 2 PRODUCED MAINLY THE CIS-ANTI-CIS AND CIS-SYN-CIS ISOMERIC PRODUCTS OF 1,2,1',2' ADDITION. BOTH MECHANISMS WERE SENSITIZED BY THE APROTIC SOLVENTS BENZENE, N-HEXANE, CYCLOHEXANE, AND DI-N-PROPYL ETHER, AND WERE INHIBITED BY THE PROTIC SOLVENT ETHANOL. MECHANISM 1 INVOLVED A CATIONIC CHAIN REACTION IN BENZENE, AND PROBABLY ALSO IN THE OTHER APROTIC SOLVENTS. IN ALL THE APROTIC SOLVENTS THE YIELD OF THE DIELS-ALDER PRODUCTS WENT THROUGH A MAXIMUM AS THE 1,3-CYCLOHEXADIENE (CHD) CONCENTRATION WAS INCREASED. THERE WAS NO EVIDENCE OF A CHAIN IN MECHANISM 2 AND THE YIELDS OF THE CORRESPONDING DIMERS WERE RELATIVELY SMALL. IT APPEARS THAT TRIPLET-STATE CHD MOLECULES WERE THE IMMEDIATE PRECURSORS OF THE DIMERS FROM MECHANISM 2, AND THAT ROUGHLY HALF OF THE TRIPLET CHD MOLECULES RESULTED DIRECTLY OR INDIRECTLY FROM NEUTRALIZATION REACTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 699 474 20/12 7/5 7/4
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH

Y(2+) AS A COLOR CENTER IN IRRADIATED CAF2, (U)

AUG 68 15P THEISSING,H. H. ;EWANIZKY, T. F. ;CAPLAN,P. J. ;GROSSE,D. W. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V40 N6 P2657-2671, 15 MAR 69.

DESCRIPTORS: (*YTTRIUM, *COLOR CENTERS), (*CALCIUM FLUORIDES, COLOR CENTERS), (*RADIATION CHEMISTRY, COLOR CENTERS), ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, GAMMA RAYS, CRYSTAL DEFECTS, MOLECULAR ENERGY LEVELS (U)
IDENTIFIERS: JAHN-TELLER EFFECT, *LIGAND FIELDS (U)

THE ABSORPTION SPECTRUM OF BLUE, GAMMA-IRRADIATED CAF2:Y(3+) CRYSTALS SHOWS SEVERAL BANDS IN THE VISIBLE REGION WHOSE INTENSITY IS ROUGHLY PROPORTIONAL TO THE YTTRIUM CONCENTRATION. BLEACHING INTO THE INDIVIDUAL BANDS INDICATES THAT MORE THAN ONE CENTER IS RESPONSIBLE FOR THE WHOLE SPECTRUM. INCONSISTENT COLOR RESPONSE OF VARIOUS CRYSTAL SAMPLES TO GAMMA IRRADIATION SUGGESTS THAT ONLY THE CRYSTALS WITH SUFFICIENT Y(3+) IN CUBIC SITES, I.E., WITH THE CHARGE COMPENSATOR SOME DISTANCE AWAY, ARE COLORABLE. IN THIS CASE THE Y(2+) FORMED BY GAMMA IRRADIATION, AS WELL AS THE DEFECTS PRODUCED AT THE REMOTE CHARGE COMPENSATORS, BECOME COLOR CENTERS AND SHARE IN THE GENERATION OF THE SPECTRAL BANDS. THE QUESTION OF WHICH BAND (S) WOULD BE DUE TO Y(2+) IS EXAMINED BY FITTING THE BAND FREQUENCY TO THE ENERGY DIFFERENCE 'E' - 'T' OF THE CUBIC FIELD-SPLIT D(1) LEVEL OF Y(2+) AND THE BANDWIDTH TO THE SPREAD OF THE 'T' LEVEL INTO ITS COMPONENTS DUE TO A DYNAMIC JAHN-TELLER EFFECT. THE BEST FIT TURNS OUT TO BE THE 17 500/CM BAND WHICH YIELDS REASONABLE VALUES FOR CUBIC FIELD STRENGTH D(Q), VIBRATIONAL DISPLACEMENT OF F(-) IONS, AND JAHN-TELLER ENERGY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 699 623 7/5
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

THE RADIOLYSIS OF LIQUID NITROUS OXIDE, (U)

OCT 67 3P ROBINSON,M. G. ;FREEMAN,G. R. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V72 N4 P1394-1396 APR 68. NO COPIES FURNISHED.

DESCRIPTORS: (*NITROGEN OXIDES, *RADIATION CHEMISTRY), LIQUEFIED GASES, CANADA (U)
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, *NITROGEN OXIDE(N2O), *RADIOLYSIS (U)

DURING THE COURSE OF RECENT INVESTIGATIONS OF THE EFFECT OF NITROUS OXIDE ON THE RADIOLYSIS OF LIQUID HYDROCARBONS, AN ESTIMATE OF THE YIELD OF NITROGEN FROM THE 'DIRECT RADIOLYSIS' OF NITROUS OXIDE IN THE LIQUID PHASE WAS REQUIRED. ACCORDINGLY, THE RADIOLYSIS OF PURE LIQUID NITROUS OXIDE AND OF NITROUS OXIDE--CYCLOPENTANE SOLUTIONS WERE INVESTIGATED AND THE RESULTS ARE REPORTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 699 667 7/5
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

CHARGE SCAVENGING VS HYDROGEN ATOM SCAVENGING IN THE RADIOLYSIS OF LIQUID SATURATED HYDROCARGONS, (U)

SEP 67 7P ROBINSON,M. G. ;FREEMAN,G. R. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V48 N3 P983-989, 1 FEB 68. NO COPIES FURNISHED.

DESCRIPTORS: (*HYDROCARBONS, *RADIATION CHEMISTRY), PROPENES, NITROGEN OXIDES, CYCLOHEXANES, REACTION KINETICS, CARBON DIOXIDE, CANADA (U)
IDENTIFIERS: NITROGEN OXIDE(N2O), *RADIOLYSIS (U)

THE NITROGEN AND HYDROGEN YIELDS FROM THE GAMMA RADIOLYSIS OF SOLUTIONS OF NITROUS OXIDE IN VARIOUS SATURATED HYDROCARBONS WERE MEASURED. THE NITROGEN YIELDS WERE NEARLY THE SAME IN ALL HYDROCARBONS, BUT THE AMOUNTS OF DECREASE IN THE HYDROGEN YIELDS CAUSED BY THE NITROUS OXIDE VARIED MARKEDLY. THE RESULTS SUPPORT THE SUGGESTION THAT NITROUS OXIDE REACTS WITH ELECTRONS RATHER THAN HYDROGEN ATOMS IN LIQUID HYDROCARBONS, BUT INDICATE THAT SOME NITROGEN IS ALSO FORMED BY ANOTHER REACTION AND THAT ALL ELECTRONS DO NOT EVENTUALLY LEAD TO HYDROGEN FORMATION DURING THE RADIOLYSIS OF THE PURE HYDROCARBON. THE GASEOUS PRODUCT YIELDS FROM BINARY CYCLOHEXANE SOLUTIONS OF NITROUS OXIDE AND OF PROPYLENE WERE SUBJECTED TO KINETIC ANALYSIS ACCORDING TO SEVERAL MODELS. IT WAS CONCLUDED THAT THE DECREASE IN HYDROGEN YIELD CAUSED BY NITROUS OXIDE AND BY PROPYLENE CAN BE QUANTITATIVELY INTERPRETED IN TERMS OF INTERACTIONS BETWEEN THE SOLUTES AND THE CHARGED INTERMEDIATES. THIS OFFERS AN ALTERNATIVE TO THE HYDROGEN ATOM SCAVENGING MECHANISM THAT HAS USUALLY BEEN ASSUMED IN THE PAST FOR PROPYLENE. ALTHOUGH CARBON DIOXIDE AND PROPYLENE DO NOT ATTACH ELECTRONS IN THE GAS PHASE, THEY APPEAR TO DO SO IN LIQUID ALKANES. PROPYLENE IS A SOMEWHAT LESS EFFICIENT SCAVENGER THAN IS NITROUS OXIDE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 699 668 7/5 7/4
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

THE RADIOLYSIS OF CYCLOHEXANE IN THE PRESENCE OF DEUTERATED OLEFINS. THE INVOLVEMENT OF THE OLEFINS IN HYDROGEN FORMATION, (U)

NOV 67 3P ROBINSON, M. G. ; FREEMAN, G. R. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V72 N5 P1780-1782 MAY 68. NO COPIES FURNISHED.

DESCRIPTORS: (*CYCLOHEXANES, *RADIATION CHEMISTRY), REACTION KINETICS, DEUTERIUM COMPOUNDS, ALKENES, HYDROGEN, DEUTERIUM, CANADA (U)
IDENTIFIERS: HYDROGEN ABSTRACTION, *RADIOLYSIS (U)

THE HYDROGEN YIELDS FROM THE RADIOLYSIS OF CYCLOHEXANE SOLUTIONS CONTAINING LOW CONCENTRATIONS OF DEUTERATED OLEFINS (C3-C7) HAVE BEEN MEASURED. THE PRESENCE OF SIGNIFICANT AMOUNTS OF HD AND D2 IN THE PRODUCTS CONFIRMS AN EARLIER SUGGESTION THAT THE OLEFINS PARTICIPATE IN HYDROGEN FORMATION AS WELL AS ACTING AS INHIBITORS. HOWEVER, IT IS MAINLY THE ALKYL GROUPS OF THE FULLY DEUTERATED OLEFINS THAT ARE INVOLVED IN HD FORMATION. A SMALL AMOUNT OF MOLECULAR D2 ELIMINATION OCCURS FROM THE OLEFINIC CARBONS. THE ADDITION OF ETHANOL TO A SOLUTION OF C3D6 IN CYCLOHEXANE REDUCED THE YIELDS OF HD AND D2 BY THE SAME PROPORTIONATE AMOUNTS. THE RESULTS ARE EXPLAINED BY IONIC REACTIONS. THERE IS NO CLEAR-CUT EVIDENCE FOR THE OCCURRENCE OF HYDROGEN ATOM SCAVENGING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 700 348 7/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

MECHANISM OF IONIZING-RADIATION ACTION ON SULFOCATIONS (O MEKHANIZME DEISTVIYA IONIZIRUYUSHCHEGO IZLUCHENIYA NA SULFOKATIONITY), (U)

JAN 70 16P TULUPOV,P. E. ;BYCHKOV,N. V. ;KASPEROVICH,A. I. ;ROGINSKAYA,B. S. ;

REPT. NO. FSTC-HT-23-141-70
PROJ: FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. SINTEZ I SOVYSTVA IONOOBMENNYKH MATERIALOV (SYNTHESIS AND PROPERTIES OF ION-EXCHANGE MATERIALS) MOSCOW, 1968 P125-133.

DESCRIPTORS: (*ION EXCHANGE RESINS, *RADIATION CHEMISTRY), (*SULFITES, RADIATION CHEMISTRY), IONS, WATER, ION EXCHANGE, INFRARED SPECTRA, STYRENE PLASTICS, IONIZATION, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

AN INVESTIGATION WAS MADE OF THE MECHANISM OF THE EXCHANGE CAPACITY REDUCTION IN SULFOPOLYSTYRENE CATION EXCHANGERS DURING IRRADIATION IN WATER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 700 378 7/5 6/1
CALGARY UNIV (ALBERTA) DEPT OF CHEMISTRY

THE COBALT-60 GAMMA-RADIOLYSIS OF REDUCED GLUTATHIONE IN DEAERATED AQUEOUS SOLUTIONS, (U)

JUN 68 7P LAL,MANOHAR ;ARMSTRONG,D. A. ;WIESER,META ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN RADIATION RESEARCH, V37 N2 P246-252 FEB 69. NO COPIES FURNISHED.

DESCRIPTORS: (*GLUTATHIONE, *RADIATION CHEMISTRY), GLUTAMINE, PEPTIDES, SULFIDES, GAMMA RAYS, OXIDATION, CANADA (U)
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, *RADIOLYSIS, DISULFIDES (U)

THE MAJOR PRODUCTS OF RADIOLYSIS OF AIR-FREE AQUEOUS SOLUTIONS OF THE TRIPEPTIDE GLUTATHIONE ARE HYDROGEN, HYDROGEN SULFIDE, OXIDIZED GLUTATHIONE, AND GAMMA-GLUTAMYLALANYLGLYCINE. THE LAST OF THESE RESULTS FROM THE REPLACEMENT OF SH BY H. THERE IS NO EVIDENCE FOR SCISSION OF THE PEPTIDE CHAIN, AND THE PH DEPENDENCE AND MAGNITUDES OF THE PRODUCT YIELDS CLOSELY RESEMBLE THOSE OF THE ANALOGOUS PRODUCTS FROM CYSTEINE SOLUTIONS. THE RADIOLYTIC MECHANISM IS SHOWN TO BE SIMILAR TO THAT FOR CYSTEINE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 701 876 19/1 7/5
PICATINNY ARSENAL DOVER N J

THE EFFECTS OF REACTOR IRRADIATION ON THE CHEMICAL CHARACTERISTICS OF SOLID EXPLOSIVES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 70 74P RIBAUDO,CHARLES ;MALLAY,
JAMES ;MATSUGUMA,HAROLD J. ;
REPT. NO. PA-TR-3893

UNCLASSIFIED REPORT

DESCRIPTORS: (*EXPLOSIVES, *RADIATION CHEMISTRY), TNT, HMX, PETN, INFRARED SPECTRA, X RAY DIFFRACTION, DIFFERENTIAL THERMAL ANALYSIS, NITROCELLULOSE, SOLID ROCKET PROPELLANTS (U)
IDENTIFIERS: *NITRO COMPOUNDS, DATB EXPLOSIVE (U)

A STUDY WAS MADE OF TNT, HMX/EXON (9505), DATB, AND PETN WHICH HAD BEEN IRRADIATED IN A NUCLEAR REACTOR TO DETERMINE CHEMICAL CHANGES INDUCED BY THE IRRADIATION. CHEMICAL CHANGES (STABILITY) WERE DETERMINED BY INFRARED SPECTROPHOTOMETRIC, X-RAY DIFFRACTION, AND DIFFERENTIAL THERMAL ANALYSIS OF THE POST-IRRADIATED EXPLOSIVES. IN ADDITION, A SIMILAR STUDY OF NITROCELLULOSE-BASE PROPELLANTS WAS CARRIED OUT. FROM THE DATA OBTAINED, THE ORDER OF DECREASING CHEMICAL STABILITY UNDER IRRADIATION WAS DATB, HNX/EXON, TNT, PETN, AND THE NITROCELLULOSE-BASE PROPELLANTS; DATB WAS FOUND TO BE THE MOST STABLE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 701 946 7/5 11/10
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

INVESTIGATION OF THE RADIOCHEMICAL SENSITIZATION EFFECT IN RUBBER (ISSLEDOVANIE EFFEKTA SENSIBILIZATSII RADIATSIONNO KHLMICHESKIKH PROTSESSOV V KAUCHUKAKH), (U)

NOV 69 19P KOZLOV,V. T. ;KAPLUNOV,M. YA. ;TARASOVA,Z. N. ;DOGADKIN,B. A. ;
REPT. NO. FSTC-HT-23-139-70
PROJ: FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE SOEDINENIYA. SERIYA A (USSR) V10 N5 P987-994 1968.

DESCRIPTORS: (*RADIATION CHEMISTRY, *CROSSLINKING(CHEMISTRY)), (*RUBBER, RADIATION CHEMISTRY), (*SYNTHETIC RUBBER, RADIATION CHEMISTRY), (*HALOGENATED HYDROCARBONS, RADIATION CHEMISTRY), ELECTRON IRRADIATION, CHLORINE COMPOUNDS, FREE RADICALS, USSR (U)
IDENTIFIERS: *CHLORINE ORGANIC COMPOUNDS, *RADIOLYSIS, *FREE RADICAL SCAVENGERS, STYRENE BUTADIENE RESINS, TRANSLATIONS (U)

CERTAIN CHARACTERISTIC EFFECTS OF A NUMBER OF HALOGEN CONTAINING COMPOUNDS, USED EARLIER AS RADIO-CHEMICAL STRUCTURING SENSITIZERS FOR RUBBERS OF DIFFERENT STRUCTURE WERE INVESTIGATED. AS A RESULT OF THE INVESTIGATION, THE FOLLOWING CONCLUSIONS WERE DRAWN: (1) DURING RADIOLYSIS THE SENSITIZATION EFFECT IN A NUMBER OF HALOGEN CONTAINING ORGANIC SUBSTANCES INCREASES FROM COMPLEX AROMATIC STRUCTURES WITH A LARGE NUMBER OF ATOMS TO LINEAR STRUCTURES WITHOUT DOUBLE BONDS AND WITH A SMALL NUMBER OF ATOMS; (2) IN THE GENERAL CASE OF THE SENSITIZATION EFFECT IS DISPLAYED BY COMPOUNDS CONTAINING ATOMS WITH HIGH ELECTRONAFFINITY AND POSSESSING THE ABILITY TO ACCEPT THERMALIZED ELECTRONS; (3) DURING THE RADIOLYSIS OF APPROPRIATE SENSITIZERS ONE OF THE MOST IMPORTANT PROCESSES IS THE SPLITTING OF HALOGEN, WHERE A SIGNIFICANT CONTRIBUTION IS MADE BY THE DISSOCIATIVE ELECTRON CAPTURE REACTION;

(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 701 958 7/5
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

SECONDARY PROCESSES IN GAS PHASE RADIOLYSIS OF HYDROCARBONS. (U)

AUG 60 3P FUTRELL, JEAN H. ;
REPT. NO. ARL-116

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V65 P565-566 1961.

DESCRIPTORS: (*HYDROCARBONS, *RADIATION CHEMISTRY), VAPORS (U)
IDENTIFIERS: *RADIOLYSIS (U)

IRRADIATION STUDIES OF HYDROCARBON VAPORS MUST BE CONDUCTED AT VERY LOW CONVERSION IF MEANINGFUL RESULTS ARE TO BE OBTAINED. OTHER AUTHORS HAVE DEMONSTRATED THAT UNSATURATED PRODUCTS FORMED WITH VERY HIGH YIELD INITIALLY IN ALPHA-PARTICLE AND GAMMA-RADIOLYSIS ACT AS INTERNAL SCAVENGERS; THUS A VERY LOW STEADY-STATE CONCENTRATION OF UNSATURATES IS MEASURED AT CONVERSIONS OF A FEW PER CENT. THIS IS VERY REASONABLY ATTRIBUTED TO HYDROGEN ATOM SCAVENGING BY THE UNSATURATED PRODUCTS. SUCH BEHAVIOR, HOWEVER, IS DISTINCTLY DIFFERENT FROM THAT OBSERVED IN AN EARLIER STUDY OF NORMAL HEXANE WITH 2 MEV. ELECTRONS FROM A VAN DE GRAAFF ACCELERATOR. SEVERAL EXPLORATORY EXPERIMENTS WERE PERFORMED IN AN ATTEMPT TO RESOLVE THIS DISCREPANCY AND THE RESULTS ARE REPORTED IN THIS COMMUNICATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 702 598 7/5
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

GAS PHASE RADIOLYSIS OF N-PENTANE, (U)

APR 60 4P FUTRELL, JEAN H. ;
REPT. NO. ARL-TN-60-183

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V64 P1634-1636 1960.

DESCRIPTORS: (*ALKANES, *RADIATION CHEMISTRY), VAPORS, GAMMA RAYS, IONIZATION, FREE RADICALS (U)
IDENTIFIERS: *PENTANES, *RADIOLYSIS (U)

PYREX AMPOULES OF N-PENTANE VAPOR WERE EXPOSED TO COBALT-60 GAMMA-RAYS AND HUNDRED ELECTRON VOLT YIELDS OF THE LOWER MOLECULAR WEIGHT PRODUCTS WERE DETERMINED. IN DECREASING ORDER OF IMPORTANCE THESE INCLUDED HYDROGEN, PROPANE, ETHYLENE, ETHANE, METHANE, PROPYLENE, ACETYLENE AND BUTANE. THE MAGNITUDE OF THE YIELDS AND THE PRODUCT DISTRIBUTION ARE CONSISTENT WITH THE ASSUMPTION THAT THE REACTION SEQUENCE IS IONIZATION OF THE MOLECULE, FRAGMENTATION, REACTION OF THE FRAGMENT IONS WITH PENTANE MOLECULES, AND NEUTRALIZATION OF THE PRODUCT IONS, FOLLOWED BY INTERCOMBINATION OF FREE RADICALS FROM THESE PROCESSES. CERTAIN IMPLICATIONS OF THIS MECHANISM ARE SUGGESTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 702 603 7/5
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

EXAMINATION OF GAMMA-IRRADIATED BENZENE FOR OPTICAL ACTIVITY, (U)

60 4P SPIALTER,LEONARD ;FUTRELL, JEAN H. ;
REPT. NO. ARL-TN-60-188

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN NATURE, V188 N4746 P225-226, 15 OCT 60.

DESCRIPTORS: (*BENZENE, *RADIATION CHEMISTRY), (*MOLECULAR ROTATION, BENZENE), GAMMA RAYS (U)

THE GAMMA-IRRADIATION OF PURIFIED BENZENE WAS UNDERTAKEN TO DETERMINE IF PREVIOUS RUSSIAN RESEARCH WHICH CLAIMED AN OPTICALLY ACTIVE COMPOUND WAS FORMED UPON BENZENE IRRADIATION WAS TRUE. THE AUTHORS FOUND NO EVIDENCE OF THE FORMATION OF AN OPTICALLY ACTIVE COMPOUND. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 702 924 7/5
PICATINNY ARSENAL DOVER N J

RADIATION-INDUCED NITRATION OF BENZENE WITH DINITROGEN TETROXIDE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 70 36P SMETANA,ANDREW F. ;
CASTORINA,THOMAS C. ;
REPT. NO. PA-TR-3915

UNCLASSIFIED REPORT

DESCRIPTORS: (*NITROBENZENES, SYNTHESIS(CHEMISTRY)), (*BENZENE, *NITRATION), (*RADIATION CHEMISTRY, NITRATION), NITROGEN OXIDES, FREE RADICALS (U)
IDENTIFIERS: *NITRO COMPOUNDS, NITROGEN OXIDE(NO2), *BENZENE/DINITRO, CHEMICAL REACTION MECHANISMS (U)

THE GAMMA-RADIATION-INDUCED NITRATION OF BENZENE WITH DINITROGEN TETROXIDE (N2O4) IN THE LIQUID PHASE AT 20C YIELDED NITROBENZENE (NB) AS THE MAJOR PRODUCT AND THE ISOMERIDES OF DINITROBENZENE (DNB) AS THE MINOR PRODUCTS OF RADIOLYSIS. THE YIELD G(NB) INCREASED WITH INCREASING CONCENTRATION OF N2O4 FROM 0.14 FOR 6 MOLE % N2O4 TO 1.18 FOR 95 MOLE % N2O4 IN BENZENE. THE RATIO OF O- TO P-DNB IS THE INVERSE OF THAT OBTAINED FROM CONVENTIONAL MIXED ACID NITRATION AND IS CONSIDERED TYPICAL OF RADIOLYSIS. THE NITRO-SUBSTITUTION PRODUCT FORMATIONS ARE SHOWN TO BE FROM PRIMARY PROCESSES OF RADIOLYSIS AND ARE PROPOSED AS BEING DERIVED FROM AN INTERMEDIATE SPECIE INVOLVING AN NO2.C6H5H(+) PI-DONOR COMPLEX. THE NO2 IN EQUILIBRIUM WITH THE N2O4 IN THE LIQUID PHASE IS REGARDED AS THE NITRATING AGENT IN THE FORM OF A RADICAL AS WELL AS A NITRONIUM ION (NO2(+)). BOTH WATER AND NITROUS ACID AS SECONDARY PRODUCTS OF RADIOLYSIS ARE SUGGESTED AS ANTI-CATALYSTS INHIBITING THE DEGREE OF THE RADIATION-INDUCED NITRATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 703 024 7/4
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DEVELOPMENT OF PHYSICAL CHEMISTRY (SELECTED ARTICLES), (U)

FEB 70 230P EMANUEL,N. M. ;KOLESOV,V. P. ;BUGAENKO,L. T. ;SARAEVA,V. V. ;TSETLIN, B. L. ;
REPT. NO. FTD-MT-24-332-69
PROJ: FTD-60107

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO. RAZVITIE FIZICHESKOI KHIMII, N.P., 1967 P14-82, 311-383, BY EDWIN P. PENTECOST.

DESCRIPTORS: (*RADIATION CHEMISTRY, REVIEWS), (*THERMOCHEMISTRY, REVIEWS), (*REACTION KINETICS, REVIEWS), BIBLIOGRAPHIES, HISTORY, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

REVIEWS ARE PRESENTED ON THE HISTORICAL BACKGROUND OF THREE AREAS OF PHYSICAL CHEMISTRY: CHEMICAL KINETICS (418 REFERENCES); THERMOCHEMISTRY (217 REFERENCES); AND RADIATION CHEMISTRY (271 REFERENCES). (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 705 691 11/12 7/5
SVENSKA TRAFORSKNINGSINSTITUTET STOCKHOLM

THE EFFECT OF GAMMA-RADIATION ON SOME PAPER PROPERTIES, (U)

OCT 68 7P KUBAT,JOSEF ;MARTIN-LOF, SVERKER ;DE RUVO,ALF ;
REPT. NO. MEDDELANDE-549

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN SVENSK PAPPERSTIDNING, V71 N23 P851-856 1968. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SWEDISH FOREST PRODUCTS RESEARCH LAB., STOCKHOLM.

DESCRIPTORS: (*PAPER, *RADIATION CHEMISTRY), (*CELLULOSE, RADIATION CHEMISTRY), WOOD PULP, GAMMA RAYS, HYDRAZINE, MECHANICAL PROPERTIES, SWEDEN (U)
IDENTIFIERS: PAPERMAKING, RADIOLYSIS, *SULFATE PULPING (U)

THE EFFECT OF GAMMA-RADIATION (60CO) ON CERTAIN PROPERTIES OF SHEETS MADE FROM BLEACHED AND UNBLEACHED SULPHATE PULP HAS BEEN STUDIED. PROPERTIES EXAMINED INCLUDED TENSILE AND ELONGATION BEHAVIOUR, BURST AND TEAR FACTORS, BRIGHTNESS AND WATER ABSORPTION (COBB). AS FAR AS THE MECHANICAL PROPERTIES AND THE BRIGHTNESS WERE CONCERNED NO CHANGES WERE NOTED WITH DOSES UP TO CA. 10 TO THE 6TH RAD. FURTHER IRRADIATION LED TO A MARKED DETERIORATION BOTH IN STRENGTH AND IN BRIGHTNESS. IN THE PRESENCE OF HYDRAZINE, A RADICAL SCAVENGER, THE CRITICAL RADIATION DOSE COULD BE INCREASED. FOR ROSIN SIZED PAPER A MINIMUM IN THE COBB WATER ABSORPTION VALUE WAS OBSERVED AT CA 10, 000 RAD. IN CONTRAST TO THE MECHANICAL AND OTHER PROPERTIES THE DP DECREASED WITH INCREASING RADIATION DOSE OVER THE WHOLE OF THE RANGE STUDIED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 709 817 7/5
CALIFORNIA INST OF TECH PASADENA DEPT OF CHEMISTRY

RADIATION-INDUCED REACTIONS OF 1,3-CYCLOHEXADIENE, (U)

SEP 69 8P PENNER,THOMAS L. ;WHITTEN, DAVID G. ;HAMMOND,GEORGE S. ;
CONTRACT: AF 49(638)-1479
PROJ: AF-9538
MONITOR: AFOSR 70-2036TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF AMERICAN CHEMICAL SOCIETY, V92 N9 P2861-2867, 6 MAY 70.

DESCRIPTORS: (*CYCLOHEXENES, *RADIATION CHEMISTRY), DIENES, GAMMA RAYS, MOLECULAR ORBITALS (U)
IDENTIFIERS: *CYCLOHEXADIENE COMPOUNDS, *DIMERIZATION (U)

IRRADIATION OF 1,3-CYCLOHEXADIENE WITH GAMMA RAYS LEADS TO DIMERIZATION EITHER IN SOLUTION OR IN THE NEAT LIQUID. RELATIVE AMOUNTS OF THE PRODUCTS VARY WIDELY WITH REACTION CONDITIONS BUT THE COMPOSITION OF THE MIXTURES CAN BE EXPRESSED AS CONSISTING OF VARIABLE AMOUNTS OF TWO GROUPS. ONE SET OF PRODUCTS CORRESPONDS TO THOSE FORMED IN THERMAL DIMERIZATION AND THE OTHER HAS THE DISTRIBUTION FOUND IN PHOTODIMERIZATION MEDIATED BY TRIPLET SENSITIZERS. FORMATION OF THE 'THERMAL' DIMERS IS INHIBITED BY ISOPROPYL ALCOHOL, A CATION SCAVENGER, AND PROMOTED BY ELECTRON SCAVENGERS SO A CATIONIC MECHANISM IS POSTULATED. RING CLEAVAGE TO GIVE 1,3,5-HEXATRIENE IS ALSO OBSERVED AND ATTRIBUTED TO AN EXCITED SINGLET STATE OF THE DIENE. SINCE RING OPENING IS NOT AFFECTED BY ELECTRON PROCESSES AND THAT TRIPLETS ARE PRODUCED BY CHARGE NEUTRALIZATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 710 231 7/5
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

ELECTRON SPIN RESONANCE STUDIES ON GAMMA-IRRADIATED KMNO4, (U)

MAY 70 63P WHITE,KEVIN J. ;
REPT. NO. BRL-1482
PROJ: RDT/E-1-T-061102-B-13-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*PERMANGANATES, *ELECTRON PARAMAGNETIC RESONANCE), (*RADIATION CHEMISTRY, PERMANGANATES), POTASSIUM COMPOUNDS, FREE RADICALS, GAMMA RAYS, HYPERFINE STRUCTURE (U)
IDENTIFIERS: *POTASSIUM PERMANGANATE (U)

ELECTRON SPIN RESONANCE (ESR) STUDIES WERE CARRIED OUT ON THE RADICALS PRODUCED BY THE GAMMA-IRRADIATION OF SINGLE CRYSTALS OF KMNO4. A CRYSTAL HOLDER HAS BEEN DESIGNED WHICH ALLOWS AN ACCURATE ORIENTATION OF THE CRYSTAL. ANALYSIS OF THE DATA YIELDS AT LEAST TWO PARAMAGNETIC SPECIES. THE FIRST RADICAL IS PRODUCED BY ROOM TEMPERATURE IRRADIATION AND GIVES A SINGLE LINE FOR EACH OF TWO INEQUIVALENT MAGNETIC SITES. THERE IS NO RESOLVABLE HYPERFINE STRUCTURE. THE SPECTRUM IS TENTATIVELY ASSIGNED TO THE MNO2 OR THE MNO4 RADICAL. THE SECOND RADICAL IS PRODUCED BY IRRADIATION AT 77K AND THE SPECTRUM DISAPPEARS IRREVERSIBLY AT SLIGHTLY HIGHER TEMPERATURES. THIS SPECTRUM IS ASSIGNED TO THE MNO4(-2) RADICAL. THE RELATIONSHIP OF THE RADICALS OBSERVED TO THE EFFECT OF HIGH ENERGY RADIATION ON THE DECOMPOSITION OF KMNO4 IN THE LIGHT OF CURRENT SOLID STATE THEORY IS DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 710 467 7/5 6/18
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

COBALT-60-GAMMA RADIOLYSIS OF OXYGENATED AQUEOUS SOLUTIONS OF CYSTEINE AT PH7, (U)

AUG 69 7P PACKER,J. E. ;WINCHESTER, R. V. ;

CONTRACT: AF-AFOSR-950-65
PROJ: AF-9760
MONITOR: AFOSR 70-2216TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CANADIAN JNL. OF CHEMISTRY, V48 N3 P417-421 1970.

DESCRIPTORS: (*THIOLS, *RADIATION CHEMISTRY), (*AMINO ACIDS, RADIATION CHEMISTRY), OXYGEN, GAMMA RAYS, SOLUTIONS(MIXTURES), ORGANIC SULFUR COMPOUNDS, FREE RADICALS, NEW ZEALAND (U)
IDENTIFIERS: *RADIOLYSIS, *CYSTEINE, *DISULFIDES (U)

IN THE RADIOLYSIS OF OXYGENATED AQUEOUS SOLUTIONS OF CYSTEINE (RSH) AT PH7, SHORT CHAIN REACTIONS OCCUR YIELDING CYSTEINE (RSSR) AND HYDROGEN PEROXIDE. TWO COMPETING REACTION PATHS INVOLVING REACTION OF THE THIYL RADICAL (RS.) WITH OXYGEN OR THIOL ANION (RS=) ARE POSTULATED TO EXPLAIN THE RESULTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 710 707 7/5
DEFENCE STANDARDS LABS ALEXANDRIA (AUSTRALIA)

ELECTRON CAPTURING BY NITROUS OXIDE IN GAMMA-IRRADIATED POLYPROPYLENE, (U)

JAN 70 4P PINKERTON,D. M. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AUSTRALIAN JNL. OF CHEMISTRY, V23 P1039-1042 1970. NO COPIES FURNISHED.

DESCRIPTORS: (*POLYETHYLENE PLASTICS, *RADIATION CHEMISTRY), (*NITROGEN OXIDES, *ELECTRON CAPTURE), ELECTRONS, GAMMA RAYS, AUSTRALIA (U)
IDENTIFIERS: NITROGEN OXIDE(N2O), *POLYPROPYLENE, *ELECTRON TRAPS (U)

AS PART OF AN INVESTIGATION OF THE DETERIORATION OF ORGANIC MATERIALS, THE AUTHORS HAVE BEEN STUDYING THE EFFECTS OF HIGH ENERGY RADIATION ON SOME POLYOLEFINS. THE COMMUNICATION REPORTS CHEMICAL EVIDENCE FOR SCAVENGEABLE ELECTRONS IN IRRADIATED POLYPROPYLENE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOMO7

AD- 711 200 7/5 6/18 6/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOLOGY

X- AND GAMMA-RADIOLYSIS OF SOME TRYPTOPHAN DIPEPTIDES, (U)

MAR 70 8P WINCHESTER,R. V. ;LYNN,K. R. ;
MONITOR: NRC 11399

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN INTERNATIONAL JNL. OF RADIATION BIOLOGY, V17 N6 P541-548 1970. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 26 FEB 7U.

DESCRIPTORS: (*PEPTIDES, *RADIATION CHEMISTRY), (*TRYPTOPHAN, PEPTIDES), X RAYS, GAMMA RAYS, FREE RADICALS, CANADA (U)

IRRADIATION OF THE DIPEPTIDES TRYPTOPHYL-GLYCINE, -ALANINE, -LEUCINE, -TRYPTOPHAN, -TYROSINE, AND -PHENYLALANINE IN AERATED SOLUTION GAVE ESSENTIALLY THE SAME PRODUCTS IN EACH CASE. THE MAJOR PRODUCTS ARE THOSE KNOWN TO ARISE FROM THE RADIOLYSIS OF TRYPTOPHAN, WHICH IS THEREFORE PROPOSED AS THE INITIAL PRODUCT OF HYDROXYL RADICAL ATTACK ON THE ALPHA-CARBON ATOM ADJACENT TO THE PEPTIDE NITROGEN. THE PRESENCE OF AN AROMATIC RING IN THE C-TERMINAL ACID (TRY-TYR, TRY-PHE) RESULTS ALSO IN HYDROXYL RADICAL ATTACK ON THIS RING.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 712 321 7/5
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

EFFECTS OF HIGH ENERGY ELECTRON IRRADIATION ON SINGLE CRYSTALS OF AMMONIUM AND SODIUM BIFLUORIDE, (U)

AUG 70 36P VANDE KIEFT,LAWRENCE J. ;
REPT. NO. BRL-1490
PROJ: RDT/E-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLUORIDES, *RADIATION CHEMISTRY), (*ELECTRON PARAMAGNETIC RESONANCE, FLUORIDES), DAMAGE, RADIATION EFFECTS, ELECTRON IRRADIATION, IONS, AMMONIUM COMPOUNDS, MOLECULAR ASSOCIATION, SODIUM COMPOUNDS (U)
IDENTIFIERS: HYDROGEN BONDING (U)

RADIATION EFFECTS IN SINGLE CRYSTALS OF AMMONIUM BIFLUORIDE AND SODIUM BIFLUORIDE WERE STUDIED BY ELECTRON SPIN RESONANCE AND OPTICAL METHODS FOLLOWING 1-MEV ELECTRON IRRADIATIONS AT 77K. THE IRRADIATIONS CHANGED THE SAMPLES FROM CLEAR TO DEEP BLUE-GREEN AND BOTH CRYSTAL TYPES SHOWED PARAMAGNETIC RESONANCES WHICH WERE DETERMINED TO RESULT FROM F2(-) IONS IN ANION SITES. THIS DEFECT RESULTED FROM THE DISPLACEMENT OF HYDROGEN ATOMS FROM THEIR NORMAL POSITIONS IN THE LINEAR BIFLUORIDE (FHF) (-) IONS. ONLY IN NH4HF2 WERE THE DISPLACED HYDROGEN ATOMS DETECTED. BEST-FIT SPIN-HAMILTONIAN PARAMETERS FOR THE F2(-) AND H DEFECTS ARE GIVEN. OPTICAL ABSORPTION MEASUREMENTS ON THE IRRADIATED BIFLUORIDES ARE DISCUSSED. THE ESR ANNEALING CHARACTERISTICS FOR THE F2(-) IONS IN BOTH CRYSTALS APPEAR TO FOLLOW SECOND-ORDER KINETICS. IN TWO OF THE THREE INEQUIVALENT SITES FOR F2(-) IONS IN NH4HF2 THE ORIENTATION OF THE F2(-) MOLECULAR AXIS DIFFERS BY EIGHT DEGREES FROM THE REPORTED CRYSTALLOGRAPHIC AXIS OF THE CORRESPONDING BIFLUORIDE ANION. THIS IS INTERPRETED TO RESULT FROM WEAKER HYDROGEN BONDING BETWEEN NITROGEN AND FLUORINE FOR THE F2(-) ION THAN FOR THE BIFLUORIDE ION IN AMMONIUM BIFLUORIDE, BECAUSE OF AN INCREASED N-H-F DISTANCE FOR THE SHORTER F2(-) IONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 713 551 7/5
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

THE EFFECT OF STRUCTURE ON RADIATION CHEMICAL REACTIVITY, (U)

69 11P KLEIN,NATHAN ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*WATER, *IONIZATION), (*RADIATION CHEMISTRY, WATER), (*EXCITONS, WATER), ELECTRON IRRADIATION, DECOMPOSITION, ELECTROLYTES (U)
IDENTIFIERS: HOLES(ELECTRON DEFICIENCIES) (U)

SEVERAL ASPECTS OF THE RADIATION CHEMISTRY OF WATER ARE DISCUSSED. IT IS PROPOSED THAT THE VERY FAST REACTION OF E(-)(AQ) IS: E(-)(AQ) + H2O(+) YIELDS H2O*. THE PRODUCT OF THE REACTION, H2O*, IS AN ELECTRON-HOLE PAIR, OR EXCITON. THE VERY LARGE SIZE AND HIGH MOBILITY OF THE WATER CLUSTER MAKES AN ENCOUNTER RADIUS OF 25A FOR THE REACTION REASONABLE. THE EXISTENCE, IN AQUEOUS SOLUTION, OF BOTH HOLES AND EXCITONS HAS BEEN PROPOSED ALTHOUGH EXPERIMENTAL EVIDENCE TO DATE IS STILL SO SPARSE AS TO BE HIGHLY CONJECTURAL. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 715 391 7/5 19/1
PICATINNY ARSENAL DOVER N J

ION-PAIR YIELDS AND KINETIC BEHAVIOR OF FREE CHARGES IN NONPOLAR LIQUIDS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 70 34P CAPELLOS,CHRISTOS ;
REPT. NO. PA-TR-4054
PROJ: DA-1-T-061102-A-32-B
TASK: 1-T-061102-A-32-B-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*EXPLOSIVES, *RADIATION CHEMISTRY), EXPLOSIONS, IONS, SOLUTIONS(MIXTURES), ELECTROSTATIC FIELDS, REACTION KINETICS, FREE RADICALS, ELECTRON IRRADIATION (U)
IDENTIFIERS: *CARBONIUM IONS, PENTANE/2-2-4-TRIMETHYL, *RADIOLYSIS (U)

YIELDS OF PH3C(+) WERE DETERMINED BY MICROSECOND AND NANOSECOND PULSE RADIOLYSIS OF TRIPHENYLMETHYLCHLORIDE SOLUTIONS IN FIVE SOLVENTS (N-HEXANE, CYCLOHEXANE, 2,2,4-TRIMETHYLPENTANE, CARBON TETRACHLORIDE, AND CARBON DISULFIDE). THESE YIELDS ARE IN EXCELLENT AGREEMENT WITH THE ION-PAIR YIELDS DETERMINED FOR THE SAME SOLVENTS BY CONDUCTIVITY METHODS. IN ADDITION, THE TRIPHENYLMETHYLCHLORIDE METHOD ALLOWS MEASUREMENTS OF RATE CONSTANTS FOR PROTON-TRANSFER AND ION-RECOMBINATION REACTIONS, AS WELL AS THE STUDY OF THE REACTIVITY OF MODEL COMPOUNDS OF EXPLOSIVES, OR EXPLOSIVES THEMSELVES, TOWARDS THE POSITIVE CHARGE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 717 243 7/5
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

PULSE RADIOLYSIS TECHNIQUES, (U)

NOV 70 45P KLEIN,NATHAN ;ROCK,THEODORE J. ;

REPT. NO. BRL-1508
PROJ: FTD/E-1-B-062104-A-8903

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, LABORATORY EQUIPMENT), TEST METHODS, PHOTOMULTIPLIER TUBES, LASERS, IONIZATION, ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, SPECTROSCOPY, ELECTROMAGNETIC PULSES, REACTION KINETICS (U)
IDENTIFIERS: *RADIOLYSIS (U)

THE REPORT DEALS WITH THE DEVELOPMENT OF ADVANCED PULSE RADIOLYSIS TECHNIQUES. DESIGN PARAMETERS FOR LIGHT SOURCES, DETECTORS AND DATA RECORDING SYSTEMS ARE DISCUSSED AND AN ANALYTICAL ARRAY IS DESCRIBED THAT MAKES POSSIBLE THE ACQUISITION OF SPECTRAL DATA WITH HIGH SENSITIVITY AND NANOSECOND RESOLVING TIME. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 718 433 7/5 20/12
KANSAS UNIV LAWRENCE DEPT OF GEOLOGY

RADIATION DAMAGE AND CHEMICAL REACTIONS INDUCED IN CRYSTALLINE SOLIDS BY HIGH-ENERGY PROTON BOMBARDMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT.. 1 JUL 68-1 JUL 70, SEP 70 55P ZELLER,EDWARD J. ; DRESCHHOFF,GISELA ;VIRMANI,YASH P. ;ZIMBRICK, JOHN ;
CONTRACT: F19628-69-C-0009
PROJ: AF-8602
TASK: 860202
MONITOR: AFCRL 70-0594

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIAMONDS, *ION BOMBARDMENT), (*ELECTRON PARAMAGNETIC RESONANCE, DIAMONDS), (*CALCIUM COMPOUNDS, *RADIATION CHEMISTRY), (*ALKALI METAL COMPOUNDS, ELECTRON PARAMAGNETIC RESONANCE), FREE RADICALS, RADIATION CHEMISTRY, PROTON BOMBARDMENT, DEUTERON BOMBARDMENT, GAMMA RAYS, PARAMAGNETIC RESONANCE, HYDROGEN, CRYSTAL DEFECTS, HALIDES, PHOSPHATES (U)
IDENTIFIERS: *ALKALI HALIDES, *CALCIUM PHOSPHATES, *ELECTRON PARAMAGNETIC RESONANCE (U)

THE PRIMARY OBJECTIVE OF THE RESEARCH WAS TO DETERMINE THE EXTENT AND NATURE OF CHEMICAL CHANGES PRODUCED IN SOLID TARGETS BY FAST HEAVY PARTICLE IRRADIATION. THE MAJOR PORTION OF THE WORK INVOLVED PROTON IRRADIATION OF SOLIDS USING ENERGY RANGES FROM 0.7 TO 2.5 MEV. ALPHA PARTICLES AND DEUTERONS WERE ALSO AVAILABLE AND WERE USED FOR SPECIAL STUDIES. IN GENERAL, THE RESULTS OF THE BOMBARDMENTS WERE EVALUATED WITH EITHER ELECTRON SPIN RESONANCE (ESR) OR DIFFERENTIAL THERMAL ANALYSIS (DTA) TECHNIQUES. THE DATA PROVIDED BY THE ESR ANALYTICAL METHODS TENDS TO SUBSTANTIATE THE CONCLUSION THAT PROTON BOMBARDMENT OF DIAMOND RESULTS IN THE FORMATION OF CH RADICALS. FURTHERMORE, THERE IS NO DOUBT THAT H ATOMS CAN BE TRAPPED IN THE DIAMOND LATTICE AND WILL REMAIN UNCOMBINED AT LIQUID NITROGEN TEMPERATURE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 718 796 7/5
DUKE UNIV DURHAM N C DEPT OF PHYSICS

SOLID STATE STUDIES WITH MICROWAVES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 OCT 63-30 SEP 70,
JAN 71 10P GORDY,WALTER ;
CONTRACT: DA-ARO-D-31-124-70-G26, DA-ARO(D)-31-124-G1053
PROJ: AROD-4131-P
MONITOR: AROD 4131:35-P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTINUATION OF GRANTS DA-ARO(D)-31-124-G-428 AND DA-ARO(D)-31-124-G-731.

DESCRIPTORS: (*ELECTRON PARAMAGNETIC RESONANCE, *RADIATION CHEMISTRY), (*MICROWAVE SPECTROSCOPY, SOLIDS), HYDROGEN, FREE RADICALS, DEOXYRIBONUCLEIC ACIDS, AMINO ACIDS, GAMMA RAYS (U)

THE FOLLOWING RESEARCH TOPICS ARE BRIEFLY SUMMARIZED: ENERGY MIGRATION AND TRANSFER IN INERT SOLIDS AT LOW TEMPERATURE; STUDY OF HYDROGEN EXCHANGE REACTIONS IN SOLIDS; STUDY OF INFORMATION STORAGE MOLECULES; STUDIES OF THE ATTACK BY THERMAL H ATOMS AND OH RADICALS ON ORGANIC MATERIALS; POLYAMINO ACIDS AN PROTEINS; AND STUDIES OF IRRADIATED SINGLE CRYSTALS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 720 473 7/4 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

SCAVENGER EFFECTS ON ELECTRONS PRODUCED BY GAMMA RAYS AND PHOTOIONIZATION IN ALKALINE ICES AT 77 K, (U)

APR 70 5P HASE,HIROTOMO ;KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-71-0653

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V74 N18 P3358-3361 1970.

DESCRIPTORS: (*RADIATION CHEMISTRY, *ICE), ELECTRONS, GAMMA RAYS, IONIZATION, REACTION KINETICS, PH FACTOR (U)
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, *ELECTRON MOBILITY (U)

ACRYLAMIDE IS USED AS AN ELECTRON SCAVENGER IN THE RADIOLYSIS AND FERROCYANIDE PHOTOIONIZATION OF 5 AND 10 MNAOH ICES. THE CONCENTRATION OF ACRYLAMIDE REQUIRED TO REDUCE THE E(T)(-) YIELD TO ONE-HALF ITS INITIAL VALUE IS HIGHER FOR GAMMA RADIOLYSIS THAN FOR FERROCYANIDE PHOTOIONIZATION BY A FACTOR OF ABOUT 3.5. THIS DIFFERENCE IS SHOWN TO BE DUE TO THE SPATIAL NONUNIFORMITY OF E(M)(-) GENERATED BY GAMMA RAYS. WITHIN THE FRAMEWORK OF A SIMPLE MODEL THE AVERAGE TRAVEL DISTANCE OF E(M)(-) IS 56 A AND 44 A IN 5 AND 10 MNAOH ICES, RESPECTIVELY, FOR BOTH PHOTOIONIZATION-PRODUCED AND RADIATION-PRODUCED ELECTRONS. A KINETIC ANALYSIS SUGGESTS THAT A HIGH CONCENTRATION OF SOLUTE MOLECULES TENDS TO DESTROY TRAPPING SITES IN THE ICES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 720 515 20/12 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

PHOTOCONDUCTIVITY IN GAMMA-IRRADIATED ALKALINE ICE, (U)

APR 70 11P EISELE,IGNATZ ;KEVAN,LARRY ;

CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-71-0628

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V53 N5 P1867-1875, 1 SEP 70.

SUPPLEMENTARY NOTE: SPONSORED IN PART BY THE ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

DESCRIPTORS: (*ICE, *PHOTOCONDUCTIVITY), (*RADIATION CHEMISTRY, ICE), (*BAND THEORY OF SOLIDS, ICE), ELECTRONS, PH FACTOR, SOLUTIONS(MIXTURES), ELECTRON TRANSITIONS (U)

IDENTIFIERS: ELECTRON MOBILITY (U)

THE PHOTOCONDUCTIVITY DUE TO RADIATION-PRODUCED TRAPPED ELECTRONS IN GLASSY ALKALINE ICE (10M NAOH) AT 77K HAS BEEN STUDIED. THE TEMPERATURE DEPENDENCE OF THE PHOTOCURRENT FROM 4 TO 120K AND THE COINCIDENCE OF THE WAVELENGTH DEPENDENCE OF THE PHOTOCURRENT WITH THE ABSORPTION BAND SHOW THAT NO STABLE BOUND EXCITED STATE EXISTS FOR THE TRAPPED ELECTRON. THE RELATION OF THIS RESULT TO THE IMPORTANCE OF SHORTRANGE INTERACTIONS IN ELECTRON BINDING IS DISCUSSED. IT IS ALSO FOUND THAT RADIATION-PRODUCED SHALLOW TRAPS FOR ELECTRONS ARE FORMED. THESE TRAPS HAVE AN AVERAGE DEPTH OF 0.048 EV AND APPEAR TO BE ASSOCIATED WITH A LATTICE DISTORTION CREATED BY THE PRESENCE OF O(-). BOTH OHMIC AND SUPER-OHMIC CURRENTS ARE FOUND UNDER CERTAIN CONDITIONS. THE SUPER-OHMIC CURRENT IS INTERPRETED AS DUE TO A VOLTAGE-DEPENDENT LIFETIME OF CONDUCTION BAND ELECTRONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 720 741 7/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

LIGHT PRODUCTS OF THE DESTRUCTION OF THE BENZENE MOLECULE BY TRITIUM RECOIL ATOMS, (U)

DEC 70 7P AVDONINA,E. N. ;
REPT. NO. FTD-HT-23-772-70
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF KHIMIYA VYSOKIKH ENERGII (USSR) V4 N1 P83-84 1970, BY D. KOOLBECK.

DESCRIPTORS: (*BENZENE, RADIATION CHEMISTRY), TRITIATED COMPOUNDS, DECOMPOSITION, ALKYNES, NEUTRON REACTIONS, USSR (U)
IDENTIFIERS: RADIOLYSIS, TRANSLATIONS (U)

DURING INVESTIGATION OF THE REACTION OF TRITIUM RECOIL ATOMS WITH LIQUID BENZENE IT WAS NOTICED THAT IN THE PRESENCE OF IODINE THE ACTIVITY OF THE GASEOUS PRODUCTS - FRACTIONS WHICH, IT WAS ASSUMED, CONSISTED EXCLUSIVELY OF HT - WAS SOMEWHAT INCREASED. GARLAND AND ROWLAND SHOWED DURING A STUDY OF THE REACTIONS OF TRITIUM RECOIL ATOMS WITH BENZENE IN THE GASEOUS PHASE THAT THE RATIO OF ACTIVITIES OF THE GAS FRACTION AND THE PARENT SUBSTANCE GROWS IN THE PRESENCE OF OXYGEN AND OF NITRIC OXIDE. TO CLARIFY THE REASON FOR THIS EXTREMELY UNEXPECTED PHENOMENON, DETERMINATION WAS MADE OF GIVEN TAGGED HYDROCARBONS AND THE HIGHLY VOLATILE FRACTION OF THE PRODUCTS FROM TRANSFORMATION OF LIQUID BENZENE IRRADIATED IN THE PRESENCE OF LITHIUM CARBONATE POWDER BY THERMAL NEUTRONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 722 446 7/5 6/15
AUCKLAND UNIV (NEW ZEALAND)

CHEMISTRY OF RADIATION PROTECTING AGENTS. (U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT. 1 MAR 68-28 FEB 71,
FEB 71 14P PACKER,J. E. ;
CONTRACT: AF-AFOSR-1417-68
MONITOR: AFOSR TR-71-0944

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIOPROTECTIVE AGENTS, *THIOLS), (*RADIATION CHEMISTRY, THIOLS), SULFUR HETEROCYCLIC COMPOUNDS, FREE RADICALS, REACTION KINETICS, KETONES, AMINES, NEW ZEALAND (U)
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, *HOMOCYSTEINE, *CYSTEINE (U)

WORK ON HOMOCYSTEINE THIOLACTONE IS FAIRLY FULLY DISCUSSED, WORK ON CYSTEINE IS ALSO REPORTED, THE CURRENT SITUATION SUMMARISED, AND THE SIGNIFICANT FEATURES OF THE OTHER SYSTEMS STUDIED SUMMARISED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 723 230 7/5
DEFENCE RESEARCH ESTABLISHMENT OTTAWA (ONTARIO)

GAMMA-RADIOLYSIS OF CYSTEINE-CYSTEAMINE DISULFIDE IN AQUEOUS SOLUTION, (U)

SEP 70 7P PURDIE,J. W. ;
RLPT. NO. DREO-627

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CANADIAN JNL. OF CHEMISTRY, V49 N5 P725-730 1971. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*SULFIDES, *RADIATION CHEMISTRY), (*THIOLS, RADIATION CHEMISTRY), FREE RADICALS, OXYGEN, AMINES, GAMMA RAYS, CANADA (U)
IDENTIFIERS: RADIOLYSIS, *CYSTEINE, *CYSTEAMINE, *DISULFIDES (U)

GAMMA-RADIOLYSIS OF A MIXED DISULFIDE, CYSTEINE-CYSTEAMINE DISULFIDE, IN UNBUFFERED AQUEOUS SOLUTION (0.3 MM) WAS INVESTIGATED IN THE PRESENCE AND ABSENCE OF OXYGEN. THE PRINCIPAL PRODUCTS WERE THE THIOLS (CYSTEINE AND CYSTEAMINE), THE CORRESPONDING SULFINIC AND SULFONIC ACIDS, THE SYMMETRICAL DISULFIDES (CYSTINE AND CYSTAMINE) AND AMMONIA. CYSTINE AND CYSTAMINE WERE FORMED IN VERY HIGH YIELDS IN DEAERATED SOLUTION; (G(CYSSCY) ABOUT 15) BUT ADDITION OF OXYGEN REDUCED THE YIELD SHARPLY AND IT WAS INVERSELY PROPORTIONAL TO THE OXYGEN CONCENTRATION EXCEPT AT VERY LOW OXYGEN LEVELS. IN AERATED SOLUTION G(CYSSCY) = 0.8. THESE OBSERVATIONS WERE ATTRIBUTED TO A CHAIN REACTION WHICH WAS SUPPRESSED BY OXYGEN. IN THE CASE OF PROTEINS, IT WAS CONCLUDED THAT ALTHOUGH CHAIN REACTIONS BETWEEN RS. RADICALS AND PROTEIN DISULFIDE BONDS WERE POSSIBLE, THEY SHOULD BE INHIBITED BY OXYGEN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 723 708 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

TRAPPED HYDROGEN ATOMS PRODUCED BY GAMMA RAYS IN ALCOHOL-WATER MIXTURES AT 77/K, (U)

MAY 70 5P HASE,HIROTOMO ;KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-71-1282

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V74 N18 P3355-3358 1970.

DESCRIPTORS: (*ALCOHOLS, *RADIATION CHEMISTRY), (*HYDROGEN, RADIATION CHEMISTRY), WATER, GAMMA RAYS, ETHANOLS, CARBINOLS, SOLUTIONS(MIXTURES) (U)
IDENTIFIERS: RADIOLYSIS (U)

SMALL H(T) YIELDS (G(MAX) ABOUT 0.1) ARE OBSERVED IN GAMMA-IRRADIATED MEOH-H2O, ETOH-H2O, AND N-PROH-H2O MIXTURES AT 77K ALTHOUGH H(T) IS NOT OBSERVED IN EITHER PURE COMPONENT AT 77K. THE H(T) YIELD SHOWS A MAXIMUM AT 0.1 TO 0.3 MOLE FRACTION ALCOHOL; THE MAXIMUM OCCURS AT LOWER MOLE FRACTION FOR LONGER CHAIN ALCOHOLS. ELECTRONS ARE ALSO TRAPPED IN THE MIXTURES AND WHEN THEY ARE PHOTOBLEACHED THE H(T) YIELDS SHOW A STRIKING CORRELATION WITH THE EXCESS ENTHALPY OF MIXING OF ALCOHOL-WATER MIXTURES; BOTH EFFECTS SEEM TO BE RELATED TO ALCOHOL-WATER COMPLEX FORMATION. EPR LINE WIDTHS IN DEUTERATED MIXTURES GIVEN INFORMATION ON THE TRAPPING SITE STRUCTURE, AND THE H(T) YIELDS IN DEUTERATE MIXTURES SUGGEST THAT MOST OF THE H(T) COMES FROM THE WATER MOLECULES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 724 224 7/5
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

THE RADIOLYSIS OF OXYGENATED CYSTEINE SOLUTIONS AT NEUTRAL PH. THE ROLE OF RSSR AND OXYGEN, (U)

APR 70 10P BARTON,J. P. ;PACKER,J. E. ;

CONTRACT: AF-AFOSR-1417-68
PROJ: AF-9760
MONITOR: AFOSR TR-71-1456

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN INTERNATIONAL JNL. FOR RADIATION PHYSICS AND CHEMISTRY, V2 P159-166 1970.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH MANCHESTER UNIV. (ENGLAND). DEPT. OF CHEMISTRY.

DESCRIPTORS: (*SULFIDES, *RADIATION CHEMISTRY), REACTION KINETICS, GAMMA EMISSION, SOLUTIONS(MIXTURES), THIOLS, NEW ZEALAND (U)
IDENTIFIERS: *ORGANIC SULFIDES, RADIOLYSIS, *CYSTEINE (U)

IT IS SHOWN THAT THE SPECIES RSSR AND RS. FORMED DURING THE PULSE RADIOLYSIS OF AQUEOUS SOLUTIONS OF CYSTEINE REACT WITH OXYGEN. THE RATE IS CALCULATED. THE REACTION RSH + O2(-) TO RS. + H2O2 IS SHOWN TO PROCEED UNDER GAMMA RADIOLYSIS CONDITIONS AT PH 7 WITH A RATE CONSTANT GREATER THAN 5 X 10 TO THE 4TH CU DM/MD-S. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 724 226 7/5
CALIFORNIA INST OF TECH PASADENA DEPT OF CHEMISTRY

RADIATION-INDUCED CHAIN ISOMERIZATION OF CIS-1,2-DIPHENYLPROPENE IN CYCLOHEXANE, (U)

JUL 70 5P PENNER,THOMAS L. ;HAMMOND, GEORGE S. ;
CONTRACT: F44620-70-C-0025
PROJ: AF-9538
MONITOR: AFOSR TR-71-1463

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V75 N2 P292-294 1971.
SUPPLEMENTARY NOTE: ALSO AVAILABLE AS CONTRIB-4099 OF GATES AND CRELLIN LABS. OF CHEMISTRY.

DESCRIPTORS: (*PROPENES, *RADIATION CHEMISTRY), SOLUTIONS(MIXTURES), MOLECULAR ISOMERISM, GAMMA RAYS (U)
IDENTIFIERS: *CYCLOHEXANE (U)

AT HIGH CONCENTRATION AND LOW RADIATION DOSEAGES, SOLUTIONS OF CIS-1,2-DIPHENYLPROPENE UNDERGO GEOMETRICAL ISOMERIZATION BY A CHAIN MECHANISM WHICH PRESUMABLY INVOLVES A CATIONIC INTERMEDIATE. UNDER THE USUAL CONDITIONS OF LOW CONCENTRATION AND HIGHER RADIATION DOSE, THE 1,2-DIPHENYLPROPENES ARE EXCELLENT EXCITATION SCAVENGERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 725 347 7/4
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

OPTICAL ABSORPTION CHARACTERISTICS AND PHOTOBLEACHING BEHAVIOR OF TRAPPED ELECTRONS IN GAMMA-IRRADIATED ALKALINE ICE, (U)

JUL 70 9P HASE,HIROTOMO ;KEVAN,LARRY ;

CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-71-1705

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL PHYSICS, V54 N3 P908-914, 1 FEB 71.

DESCRIPTORS: (*ICE, *RADIATION CHEMISTRY), (*ULTRAVIOLET SPECTRA, ICE), ABSORPTION SPECTRA, ELECTRONS, GAMMA RAYS, PH FACTOR, POLARIZATION, HYDROXIDES, PHOTOCONDUCTIVITY, (U)PHOTOCONDUCTIVITY (U)
IDENTIFIERS: QUANTUM EFFICIENCY (U)

TRAPPED ELECTRONS, E(T)(-), ARE PRODUCED BY GAMMA IRRADIATION OF ALKALINE ICE (10M NAOH) AT 77K. THE E(T)(-) ABSORPTION BAND MAXIMUM AT 590 NM SHIFTS TO SHORTER LAMDA FOR BLEACHING AT 700 NM AND SHIFTS TO LONGER GAMMA FOR BLEACHING AT 400 NM. AFTER PARTIAL BLEACHING, ELECTRONS CAN BE SHIFTED BACK AND FORTH BETWEEN TRAPS. ALTHOUGH THIS SUGGESTS AT LEAST TWO TRAP DEPTHS, THERE IS PROBABLY A BROAD SPECTRUM OF TRAP DEPTHS. THE QUANTUM EFFICIENCY FOR PHOTOBLEACHING E(T)(-) IS 0.15 AND INDEPENDENT OF LAMDA WHEN THE OPTICAL DENSITY IS MEASURED AT 590 NM. ALL OF THE CHANGES ARE EXPLAINED BY RETRAPPING AND TRAP INTERCONVERSION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 725 940 11/9
PLASTICS TECHNICAL EVALUATION CENTER DOVER N J

APPLICATIONS OF IONIZING RADIATIONS IN PLASTICS AND POLYMER TECHNOLOGY. (U)

DESCRIPTIVE NOTE: REPT. FOR 1960-1970,
MAR 71 268P READDY,ARTHUR F. , JR;
REPT. NO. PLASTEC-41

UNCLASSIFIED REPORT
AVAILABILITY: NO COPIES FURNISHED BY DDC. ORDER DIRECTLY FROM NTIS.

DESCRIPTORS: (*PLASTICS, *RADIATION CHEMISTRY), (*POLYMERS, RADIATION CHEMISTRY), (*POLYMERIZATION, RADIATION CHEMISTRY), (*REVIEWS, PLASTICS), GAMMA RAYS, ELECTRON BEAMS, CROSSLINKING(CHEMISTRY), POLYETHYLENE PLASTICS, SILICONE PLASTICS, POLYVINYL CHLORIDE, NYLON, THERMOPLASTIC RESINS, COPOLYMERIZATION, PLASTIC PAINTS, AGING(MATERIALS), PLASTIC COATINGS, POLYESTER PLASTICS, REINFORCED PLASTICS, WOOD, CONCRETE, ADHESIVES, ACRYLIC RESINS, STYRENE PLASTICS, COSTS, ELECTRIC INSULATION, PACKAGING, COMPOSITE MATERIALS (U)
IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COBALT 60, *PLASTIC WOOD COMPOSITES, POLYIMIDE RESINS, POLYBUTADIENE, POLYPROPYLENE, POLYVINYLIDENE FLUORIDE, *RADIATION POLYMERIZATION, *GRAFT POLYMERIZATION, *IONIZING RADIATION, *CONCRETE POLYMER COMPOSITES (U)

THE ACTUAL AND POTENTIAL USES OF HIGH ENERGY IONIZING RADIATIONS IN PROCESSING OF MODIFYING POLYMERS, PARTICULARLY PLASTICS, ARE SURVEYED. INCLUDED ARE DISCUSSIONS OF: THOSE METHODS AND END-PRODUCTS WHICH HAVEREACHED COMMERCIAL STATUS; ADVANCED DEVELOPMENTS AND PILOT PLANT STUDIES WITH WELL-DEFINED MARKET POTENTIALLY; AND PRELIMINARY OR PROTOTYPE WORK WHICH MAY EVENTUALLY GAIN COMMERCIAL ACCEPTANCE. DETAILS ARE GIVEN ON IRRADIATION TECHOLOGY, PRODUCTS MODIFICATION (WITH RESULTANT PROPERTIES AND RELATED DATA) AND OVERALL PROCESS ECONOMICS. THESE IMPORTANT TOPICS ARE COMPLEMENTED BY LIMITED DISCUSSIONS OF THE PHYSICS AND CHEMISTRY OF THE IRRADIATED POLYMER SUBSTRATES. THE LAST SECTION GIVES A FEW PROJECTIONS AND DEVELOPMENTS IN THE TECHNOLOGY WHICH ARE REQUIRED FOR FURTHER EFFICIENCIES AND ECONOMIES. SUCH DEVELOPMENTS WILL LEAD TO ACCELERATED ACCEPTANCE OF IONIZING RADIATION METHODS AND THE RESULTANT END-ITEMS. (AUTHOR-PL) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 727 949 7/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE VA

INVESTIGATION OF THE KINETIC AND SPECTRAL CHARACTERISTICS OF THE PRIMARY PARTICLE IN PULSE RADIOLYSIS, (U)

JUL 71 31P SHUBIN,V. N. ;KABAKCHI,S. A. ;BERUCHASHVILI,L. P. ;DOLIN,P. I. ;
REPT. NO. FSTC-HT-23-323-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF UNIDENTIFIED JNL.

DESCRIPTORS: (*RADIATION CHEMISTRY, REACTION KINETICS), SOLUTIONS, NITRATES, HYDROXIDES, SPECTRA(VISIBLE + ULTRAVIOLET), USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

THE AIM OF THE WORK WAS TO MAKE CLEAR SOME CHARACTERISTIC FEATURES OF THE KINETICS OF INTERACTION BETWEEN ACCEPTORS AND THE PRIMARY REDUCING PARTICLES FORMED BY RADIOLYSIS OF AQUEOUS ALKALINE SOLUTIONS. THE DECAY KINETICS OF THE PRIMARY SPECIES WITH LAMDA MAX. = 720 NM HAS BEEN STUDIED IN AQUEOUS SOLUTIONS, SATURATED WITH HYDROGEN OR HELIUM, CONTAINING KOH, OXYGEN, AND SODIUM NITRATE, AND SUBJECTED TO PULSE RADIOLYSIS USING A 5MEV LINEAR ELECTRON ACCELERATOR. THE DOSE PER PULSE WAS VARIED FROM 150 TO 3,000 RAD.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 728 570 7/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ELECTRON PARAMAGNETIC RESONANCE INVESTIGATION OF IRRADIATED LITHIUM ACETATE DIHYDRATE AND MERCURIC ACETATE SINGLE CRYSTALS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 71 94P CONEWAY,CLINTON JAMES ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACETATES, *RADIATION CHEMISTRY), (*FREE RADICALS, ACETATES), PARAMAGNETIC RESONANCE, LITHIUM COMPOUNDS, MERCURY COMPOUNDS, HYDRATES, HYPERFINE STRUCTURE, SINGLE CRYSTALS, THESES (U)
IDENTIFIERS: MERCURY(II) ACETATE, CARBANIONS, ELECTRON PARAMAGNETIC RESONANCE (U)

AN ELECTRON PARAMAGNETIC RESONANCE STUDY OF X-RAY IRRADIATED SINGLE CRYSTALS OF LITHIUM ACETATE DIHYDRATE AND MERCURIC ACETATE HAS BEEN MADE. THE CH2(.)CO2(-) RADICAL HAS BEEN IDENTIFIED IN LITHIUM ACETATE DIHYDRATE IRRADIATED AT LIQUID NITROGEN TEMPERATURE. THE HCH ANGLE WAS FOUND. THE PRINCIPLE ELEMENTS OF THE HYPERFINE TENSOR AND THE G TENSOR WERE CALCULATED. MERCURIC ACETATE IRRADIATED AT LIQUID NITROGEN TEMPERATURE SHOWED THE PRESENCE OF TWO CO2(-) SPECIES. SPECTRA AT -80C SHOWED THE PRESENCE OF TWO CH2(.)CO2(-) RADICALS. THE PRINCIPAL VALUES OF THE HYPERFINE TENSOR FOR THE TWO MAGNETICALLY DISTINCT SITES WERE OBTAINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 728 954 7/4
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ELECTRON PARAMAGNETIC RESONANCE INVESTIGATION OF FOREIGN RADICAL IONS IN IRRADIATED STRONTIUM AND ZINC ACETATE SINGLE CRYSTALS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 71 48P ONEY, WILLIAM EDWARD , JR;

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACETATES, *RADIATION CHEMISTRY), (*RADIATION DAMAGE, ACETATES), IMPURITIES, FREE RADICALS, DOPING, STRONTIUM COMPOUNDS, ZINC COMPOUNDS, PARAMAGNETIC RESONANCE, HYPERFINE STRUCTURE, THESES (U)
IDENTIFIERS: BUTYRATES, ELECTRON PARAMAGNETIC RESONANCE (U)

AN EPR STUDY OF X-RAY IRRADIATED ISOBUTYRATE AND N-BUTYRATE DOPED STRONTIUM ACETATE HEMIHYDRATE HAS BEEN MADE. THE N-BUTYRATE RADICAL EXHIBITED ANISTROPY WHILE THE ISOBUTYRATE DID NOT. THE N-BUTYRATE RADICAL ION HAS A SPECTRUM OF 8 LINES OF EQUAL INTENSITY. THE UNPAIRED ELECTRON IS ON THE ALPHA CARBON AND THE TWO BETA CARBON HYDROGENS ARE INEQUIVALENT. THE N-BUTYRATE RADICAL HAS BEEN SHOWN TO BE ORIENTED IN VERY NEARLY THE SAME POSITION AS THE PROPIONATE RADICAL PREVIOUSLY REPORTED AND IT OCCUPIES ONLY ONE OF THE TWO ACETATE SITES. WITHIN THIS SITE ONLY ONE ROTAMER OF THE DAMAGED ION IS THERMALLY POPULATED. THE ISOBUTYRATE ION IS SELECTIVELY DAMAGED BY A RATIO OF 300 TO 1, AND THE RATIO FOR N-BUTYRATE IS ABOUT 500 TO 1.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 729 573 7/5
DEFENCE STANDARDS LABS MARIBYRNONG (AUSTRALIA)

THE EFFECTS OF NITROUS OXIDE AND ETHYLENE ON THE GAS YIELDS AND GEL FORMATION FROM GAMMA-IRRADIATED POLYPROPYLENE, (U)

NOV 70 14P PINKERTON,D. M. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AUSTRALIAN JNL. OF CHEMISTRY, V24 P1619-1632 1971. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*POLYMERS, RADIATION CHEMISTRY), (*CROSSLINKING(CHEMISTRY), *RADIATION CHEMISTRY), GAMMA RAYS, NITROGEN OXIDES, ETHYLENES, FREE RADICALS, AUSTRALIA (U)
IDENTIFIERS: NITROGEN OXIDE(N2O), CHEMICAL REACTION MECHANISMS, *POLYPROPYLENE, *RADIATION POLYMERIZATION, *FREE RADICAL SCAVENGERS (U)

ISOTACTIC AND ATACTIC POLYPROPYLENE HAVE BEEN GAMMA-IRRADIATED IN A VACUUM, IN NITROUS OXIDE, AND IN ETHYLENE, AND ALSO IN THE PRESENCE OF MIXTURES OF THESE TWO GASES. THE GAMMA-IRRADIATION OF THE ISOTACTIC POLYPROPYLENE IN A VACUUM GIVES A H2 YIELD WHICH IS NON-LINEAR WITH DOSE, WHEREAS THE CH4 YIELD IS LINEAR WITH DOSE. YIELDS OF H2 AND CH4 FROM ATACTIC POLYPROPYLENE OBEY A LINEAR RELATIONSHIP WITH THE DOSE DELIVERED. BOTH N2O AND ETHYLENE DEPRESS THE G(H2) OBTAINED FROM VACUUM IRRADIATIONS OF ISOTACTIC POLYPROPYLENE, THE FORMER DUE TO ELECTRON SCAVENGING AND THE LATTER TO HYDROGEN ATOM SCAVENGING. COMPARED TO VACUUM IRRADIATIONS, N2O ENHANCES, AND ETHYLENE SUPPRESSES COMPLETELY, THE CROSSLINKING YIELD IN ISOTACTIC POLYPROPYLENE. IN MIXTURES, THE RESULTS ARE CONSISTENT WITH ETHYLENE PARTICIPATING IN THE ENERGY TRANSFER REACTION IN PREFERENCE TO THE N2O AND SO INHIBITING THE ADDITIONAL CROSSLINKING THAT N2O CAUSES THROUGH THE DEHYDROGENATION REACTION. A TENTATIVE REACTION SEQUENCE IS PROPOSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 730 206 7/5 20/12
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

EPR STUDIES OF MULTIPLE SILVER ATOM TRAPPING SITES PRODUCED IN GAMMA-IRRADIATED FROZEN SILVER NITRATE ICES, (U)

MAR 71 11P KEVAN,LARRY ;BALES,BARNEY L. ;

CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-71-2466

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL PHYSICS, V55 N3 P1327-1336, 1 AUG 71.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SAN FERNANDO VALLEY STATE COLL., NORTHRIDGE, CALIF. DEPT. OF PHYSICS AND ASTRONOMY.

DESCRIPTORS: (*SILVER COMPOUNDS, *RADIATION CHEMISTRY), (*PARAMAGNETIC RESONANCE, *SILVER), CRYSTAL LATTICE DEFECTS, ATOMS, ICE, GAMMA RAYS, DIPOLE MOMENTS (U)
IDENTIFIERS: POTASSIUM FLUORIDE, SILVER NITRATE, *VACANCIES(CRYSTAL DEFECTS), *ELECTRON PARAMAGNETIC RESONANCE (U)

EPR STUDIES SHOW THAT GAMMA-IRRADIATED AGNO3-KF AND AGNO3 ICES AT 77K FORM AG IN SEVERAL MAGNETICALLY DISTINCT SITES. TEMPERATURE AND OPTICAL EXCITATION CAUSE CONVERSIONS AMONG THESE SITES WITH LITTLE LOSS OF AG. FROM 77 TO 150K THE PREDOMINANT CHANGE IS FROM A MATRIX SITE CHARACTERIZED BY A SYMMETRIC ELECTRIC FIELD TO A MATRIX SITE CHARACTERIZED BY AN ASYMMETRIC ELECTRIC FIELD. THIS IS EXPLAINED IN TERMS OF WATER DIPOLE ROTATION IN RESPONSE TO THE REMOVAL OF THE ELECTRIC FIELD OF AG(+) UPON FORMATION OF AG. THE ACTIVATION ENERGIES ARE DISCUSSED IN TERMS OF L-DEFECT FORMATION AND MOTION OF THE ICE MATRIX. OPTICAL STUDIES SHOW THAT UV LIGHT CONVERTS AG2(+) TO AG IN A SYMMETRIC SITE AND THAT VISIBLE LIGHT CONVERTS AG FROM A SYMMETRIC TO AN ASYMMETRIC SITE AND PARTLY BACK TO AG2(+). (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 730 383 20/12 7/5
UNIVERSITY COLL DUBLIN (IRELAND) DEPT OF CHEMISTRY

ENERGY MIGRATION IN IRRADIATED SOLIDS. (U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT. 1 APR 67-30 MAR 71,
JUN 71 47P CUNNINGHAM,JOSEPH ;
CONTRACT: F61052-67-C-0044
PROJ: AF-9750
TASK: 975001
MONITOR: AFOSR TR-71-2402

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEMICONDUCTORS, RADIATION CHEMISTRY), ULTRAVIOLET RADIATION, PHOTOCONDUCTIVITY, PHOTOCHEMISTRY, OXIDES, ZINC COMPOUNDS, HALOGENATED HYDROCARBONS, EIRE (U)
IDENTIFIERS: METHYL IODIDE, NITROGEN OXIDE(N20) (U)

EVIDENCE FOR ENERGY MIGRATION OVER DISTANCES CA. 10 NM IN SEMICONDUCTING SOLIDS FOLLOWS FROM RESULTS OBTAINED ON ENERGY TRANSFER AT ILLUMINATED GAS/SEMICONDUCTOR AND AQUEOUS SOLUTION/SEMICONDUCTOR INTERFACES. CHEMICAL CHANGES AT GAS/SEMICONDUCTOR INTERFACES IN THE DARK INVOLVED ELECTRON LOCALIZATION BY ADSORBED MOLECULES AS SHOWN BY STUDIES OF CONDUCTIVITY, ELECTRON SPIN RESONANCE AND KINETICS. ADDITIONAL CHEMICAL REACTION WAS OBSERVED WHEN THESE DARK-EQUILIBRATED INTERFACES WERE EXPOSED TO U.V. LIGHT. FOR N2O(G)/ZNO(S), OBSERVED PHOTOCONDUCTIVITY AND KINETIC RESULTS WERE CONSISTENT WITH MIGRATION OF PHOTO-PRODUCED HOLES TO THE INTERFACE FOLLOWED BY ELECTRONS BUT THE QUANTUM EFFICIENCY WAS ONLY 0.00001. FOR CD3I(G)/ZNO(S), RESULTS WERE MORE CONSISTENT WITH MIGRATION OF EXCITONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 717 7/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PHYSICS

OPTICAL MEASUREMENTS ON SOLVATED ELECTRONS IN PULSE-IRRADIATED LIQUID PROPANE, (U)

JUN 71 3P GILLIS,H. A. ;KLASSEN,N. V. ;TEATHER,G. G. ;LOKAN,K. H. ;
MONITOR: NRC 12104

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL PHYSICS LETTERS, V10 N4 P481-483, 15 AUG 71. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*PROPANES, *SOLVENT ACTION), (*RADIATION CHEMISTRY, PROPANES), ELECTRONS, SPECTRA(INFRARED), CANADA (U)
IDENTIFIERS: *SOLVATED ELECTRONS (U)

A BROAD ABSORPTION SPECTRUM WITH LAMDA(MAX)> OR = 2000 NM HAS BEEN OBSERVED IN PULSE-IRRADIATED LIQUID PROPANE AT LOW TEMPERATURES, AND ASSIGNED TO THE SOLVATED ELECTRON. THE ELECTRON DECAYS BY GEMINATE RECOMBINATION WITH AN INITIAL HALF-LIFE OF < OR = 95 NSEC AT -185C. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 719 7/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PHYSICS

SOLVATED ELECTRONS IN DIMETHYLSULPHOXIDE, (U)

JUL 71 3P WALKER,D. C. ;KLASSEN,N. V. ;GILLIS,H. A. ;
MONITOR: NRC 12140

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL PHYSICS LETTERS, V10 N5 P636-638, 1 SEP 71. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*SULFOXIDES, *SOLVENT ACTION), (*RADIATION CHEMISTRY, SULFOXIDES), ELECTRONS, SPECTRA(INFRARED), CANADA (U)
IDENTIFIERS: *METHYL SULFOXIDE, *SOLVATED ELECTRONS (U)

THE OPTICAL ABSORPTION SPECTRUM OBTAINED BY PULSE RADIOLYSIS OF PURE LIQUID DIMETHYLSULPHOXIDE INCLUDES A BROAD INTENSE BAND IN THE NEAR IR WITH LAMDA(MAX= OR > 1500 NM. THIS BAND IS ASSIGNED TO SOLVATED ELECTRONS WITH A HALF-LIFE OF 15 PLUS OR MINUS 2 NSEC. THE LAMDA(MAX) OF THE SOLVATED ELECTRON CORRELATES BETTER WITH DIMETHYLSULPHOXIDE'S INABILITY TO SOLVATE NEGETIVE IONS THAN WITH ITS DIELECTRIC CONSTANT, WHICH IS 48. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 848 7/5
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC CHEMISTRY

GAMMA-RADIOLYSIS OF TERTIARY AROMATIC AMINES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
OCT 71 19P KHANDELWAL,G. D. ;SWAN,G. A. ;
CONTRACT: DAJA37-70-C-0234
PROJ: DA-2-061102-B-13-B
MONITOR: ARDG(E) E-1371

UNCLASSIFIED REPORT

DESCRIPTORS: (*AMINES, *RADIATION CHEMISTRY), AROMATIC COMPOUNDS, GAMMA RAYS, N-HETEROCYCLIC COMPOUNDS, FREE RADICALS (U)
IDENTIFIERS: ANILINE/N-N-DIETHYL, ANILINE/N-N-DIMETHYL, CHLOROBENZENE, *RADIOLYSIS (U)

EARLIER RESEARCH ON THE GAMMA-RADIOLYSIS OF TERTIARY AROMATIC AMINES SUCH AS NN-DIMETHYLANILINE HAS BEEN EXTENDED TO AMINES IN WHICH BETA HYDROGEN IS PRESENT E.G. L-PHENYLPYRROLIDINE, 1-PHENYLPIPERIDINE AND NN-DIETHYLANILINE. UNLIKE THE N-METHYL COMPOUNDS, THESE LATTER YIELD DIMERIC PRODUCTS WHICH ARE NOT FORMED BY SIMPLE RADICAL COUPLINE. THE ACTION OF T-BUTOXY RADICALS ON TERTIARY AROMATIC AMINES SOMETIMES LEADS TO THE SAME PRODUCTS AS DOES GAMMA-RADIOLYSIS. HOWEVER, THE ACTION OF T-BUTOXY RADICALS ON NN-DIMETHYLANILINE IN CHLOROBENZENE IS COMPLICATED. RESEARCH ON THE FORMATION OF QUINOLINE DERIVATIVES BY RADIOLYSIS OF NN-DIMETHYLANILINE IN THE PRESENCE OF N-PHENYLMALEIMIDE HAS BEEN EXTENDED BY THE USE OF DIETHYL MALEATE IN PLACE OF N-PHENYLMALEIMIDE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 736 905 7/5 7/3
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF PREPARING IODINATED PERFLUOROCARBONS, (U)

NOV 71 8P ZIMIN,A. V. ;VAYNSHTEIN,B. I. ;BUCHNEVA,A. P. ;
REPT. NO. FTD-HT-23-1282-71
PROJ: AF-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 173 213 2P 1970, BY DEAN KOOLBECK.

DESCRIPTORS: (*HALOGENATED HYDROCARBONS, *HALOGENATION), (*RADIATION CHEMISTRY, HALOGENATION), PATENTS, IONIZATION, IODINE, IODINE COMPOUNDS, FLUORINE COMPOUNDS, ALKENES, ADDITION REACTIONS, USSR (U)
IDENTIFIERS: *FLUORINE ALIPHATIC COMPOUNDS, *IODINE ALIPHATIC COMPOUNDS, *IODINATION, TRANSLATIONS, ETHYLENE/TETRACHLORO (U)

THE RUSSIAN PATENT DESCRIBES A METHOD OF OBTAINING IODINATED PERFLUOROCARBONS FROM CRYSTALLINE IODINE AND LIQUID UNSATURATED PERFLUOROCARBONS. IT IS DISTINGUISHED BY THE FACT THAT IN ORDER TO INCREASE THE EFFECTIVENESS OF THE PROCESS, THE REACTION MIXTURE IS BROUGHT TO THE PSEUDOBOILING STATE OR TO A STATE OF INTENSIVE AGITATION AND IS IRRADIATED WITH IONIZING RADIATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 737 499 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

RADIATION CHEMISTRY OF FROZEN NONPOLAR AND SLIGHTLY POLAR SYSTEMS, (U)

71 65P KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-72-0431

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ACTIONS CHIMIQUES ET BIOLOGIQUES DES RADIATIONS, V15 P81-143 1971.

DESCRIPTORS: (*RADIATION CHEMISTRY, *REVIEWS), SOLIDS, ETHERS, AMINES, KETONES, ALKENES, ALKANES, PARAMAGNETIC RESONANCE, FREE RADICALS, FURANS, IONIZATION, ELECTRONS, NITRILES, ACETONES, LUMINESCENCE, ELECTRON TRANSITION(U)
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, PHOTOIONIZATION, TETRAHYDROFURAN/2-METHYL, TRIETHYLAMINE, ELECTRON ACCEPTORS, ELECTRON PARAMAGNETIC RESONANCE (U)

THE RADIATION CHEMISTRY OF FROZEN SYSTEMS INCLUDING ETHERS, AMINES, KETONES, ALKENES AND ALKANES IS REVIEWED. THE DETECTION, REACTIVITY, TRAPPING, TRAPPING SITE STRUCTURE, SPATIAL DISTRIBUTION, AND PARTICIPATION IN ENERGY TRANSFER OF RADIOLYTIC INTERMEDIATES IS SUMMARIZED AND EVALUATED. THE EMPHASIS IS PLACED ON FACTS ESTABLISHED FOR IONIC INTERMEDIATES BY ELECTRON PARAMAGNETIC RESONANCE, OPTICAL ABSORPTION, LUMINESCENCE AND CONDUCTIVITY MEASUREMENTS, AND CORRELATION BETWEEN THESE DIFFERENT TYPES OF MEASUREMENTS IS ANALYZED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 741 551 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

OPTICAL BLEACHING EFFECTS ON THE PARAMAGNETIC RELAXATION OF TRAPPED ELECTRONS IN METHYLTETRAHYDROFURAN AT 77K, (U)

OCT 71 5P LIN,DING PING ;KEVAN,LARRY ;

CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
MONITOR: AFOSR TR-72-0988

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF PHYSICAL CHEMISTRY, V76 N5 P636-639 1972.

DESCRIPTORS: (*ELECTRONS, *RADIATION CHEMISTRY), RELAXATION TIME, FURANS, PARAMAGNETIC RESONANCE, FREE RADICALS, EXCITATION, CRYOGENICS (U)
IDENTIFIERS: SPIN SPIN INTERACTIONS (U)

OPTICAL BLEACHING OF ELECTRONS TRAPPED IN GLASSY MATRICES IS EXPECTED TO REMOVE ELECTRONS HOMOGENEOUSLY THROUGHOUT THE SYSTEM. THIS SHOULD HAVE A PREDICTABLE EFFECT ON THE RELAXATION TIME OF THE ELECTRONS AS MEASURED BY T2 (THE SPIN-SPIN RELAXATION TIME) DEPENDING ON THE INITIAL SPATIAL DISTRIBUTION. IN THIS WORK THE AUTHORS TEST THIS CONJECTURE ON ELECTRONS TRAPPED IN METHYLTETRAHYDROFURAN (MTHF) AT 77K AND CONFIRM THE SPUR MODEL OF ELECTRON TRAPPING IN THIS MATRIX. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 742 077 14/3 7/5
ARMED FORCES RADIOBIOLOGY RESEARCH INST BETHESDA MD

DIGITAL RECORDING OF EAST NONRECURRENT PHENOMENA IN PULSE RADIOLYSIS STUDIES. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
APR 72 13P MEABURN,G. M. ;ISAACS,B. M. ;
REPT. NO. AFRRI-TN72-2
PROJ: DNA-NWER-XAXM
TASK: C907

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIGITAL RECORDING SYSTEMS, *RADIATION CHEMISTRY), DESIGN, LABORATORY EQUIPMENT, REACTION KINETICS, ANALOG-TO-DIGITAL CONVERTERS (U)
IDENTIFIERS: PULSE RADIOLYSIS, *RADIOLYSIS (U)

A NEW SYSTEM IS DESCRIBED FOR DIGITAL RECORDING OF ANALOG SIGNALS IN THE MICROSECOND RANGE. THE EQUIPMENT IS BUILT AROUND A BIOMATION 610 TRANSIENT RECORDER AND TAKES ADVANTAGE OF THE FAST RESPONSE OF THE INSTRUMENT'S ANALOG TO DIGITAL CONVERTER. THE WIDE FREQUENCY RANGE OF THE SYSTEM (DC TO 2.5 MHZ) PERMITS DIGITAL RECORDING OF A RAPIDLY CHANGING NONRECURRENT SIGNAL WITH STORAGE ON PUNCHED PAPER TAPE AS AN INTERMEDIATE STEP PRIOR TO FURTHER ANALYSIS. SOME OF THE DESIGN FEATURES ARE DISCUSSED. THE EQUIPMENT IS BEING USED IN PULSE RADIOLYSIS STUDIES TO DIGITIZE PHOTOELECTRIC SIGNALS CORRESPONDING TO THE CHANGING OPTICAL ABSORPTION PROPERTIES OF SHORT-LIVED CHEMICAL SPECIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 742 651 7/5
CALIFORNIA UNIV DAVIS DEPT OF CHEMISTRY

MOLECULAR POLARIZABILITY AS A BASIS FOR ENERGY PARTITIONING ESTIMATES IN ORDINARY RADIOLYSIS, (U)

DEC 71 6P ROOT,JOHN W. ;LUCAS,LARRY L. ;
CONTRACT: AF-AFOSR-1493-68
PROJ: AF-9538
MONITOR: AFOSR TR-72-1148

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL PHYSICS LETTERS, V13 N1 P65-69 FEB 72.

DESCRIPTORS: (*RADIATION CHEMISTRY, POLARIZATION), ELECTRON IRRADIATION, DIFFERENTIAL CROSS SECTIONS, CHEMICAL BONDS, ABSORPTION (U)
IDENTIFIERS: RADIOLYSIS (U)

INDEPENDENT ASSESSMENTS OF RELATIVE ENERGY DEPOSITION IN MIXTURES BASED UPON LOW VELOCITY PROTON STOPPING CROSS SECTIONS OR UPON RADIOLYTIC IONIZATION YIELDS SUGGEST THAT THE EFFECTIVE ENERGY DEPOSITION DURING RADIOLYSIS IS PROPORTIONAL TO MOLECULAR POLARIZABILITY. THE RESULTS INDICATE THAT ENERGY PARTITIONING ESTIMATES BASED UPON THE SIMPLE MIXTURE LAW WILL BE GROSSLY INACCURATE IN SYSTEM CONTAINING HALOCARBONS OR RARE GASES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 743 172 6/18 7/5
EDGEWOOD ARSENAL MD

CERIC/CUPRIC DOSIMETRY: 5 KILORADS TO 50 MEGARADS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. SEP 67-DEC 70, MAY 72 23P BOWIE,DONALD R. ;
REPT. NO. EA-TR-4527
PROJ: DA-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*DOSIMETERS, CHEMICAL REACTIONS), (*CERIUM COMPOUNDS, DOSIMETERS), (*RADIATION CHEMISTRY, CERIUM COMPOUNDS), COPPER COMPOUNDS, GAMMA RAYS, IMPURITIES (U)
IDENTIFIERS: *CHEMICAL DOSIMETERS, COBALT 60 (U)

THE CERIC/CUPRIC CHEMICAL DOSIMETER WAS INVESTIGATED USING COBALT-60 RADIATION AT FIVE CONCENTRATIONS OVER A DOSE RANGE OF 5 KILORADS TO 50 MEGARADS. A G-VALUE OF 2.17 PLUS OR MINUS 0.01 WAS DETERMINED FOR CERIC CONCENTRATIONS FROM 1 TO 400 MILLIMOLAR, WITH A SLIGHTLY HIGHER VALUE FOR 0.20 MM. THE YIELD OF 100 AND 400 MM SOLUTIONS IS AFFECTED BY COMPETING REACTIONS, AND CORRECTION FACTORS MUST BE APPLIED. SPECTROPHOTOMETRIC ANALYSIS COMBINED WITH AUTOMATIC DILUTION TECHNIQUES WAS FOUND TO BE A CONVENIENT AND RELIABLE METHOD OF ANALYSIS. EVEN UNDER ADVERSE CONDITIONS THE PRECISION OBTAINED WITH THE SYSTEM APPROACHED THAT OF THE FRICKE DOSIMETER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 743 628 7/5
DUKE UNIV DURHAM N C DEPT OF PHYSICS

OBSERVATIONS OF TRIPLET-STATE RADICALS IN IRRADIATED SINGLE CRYSTALS OF CARBAZIDE, (U)

JUN 71 6P REISS,KEITH ;GORDY,WALTER ;
CONTRACT: DA-ARO-D-31-124-71-G23
MONITOR: AROD 9491:1-P

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL PHYSICS, V55 N11 P5329-5333, 1 DEC 71.

DESCRIPTORS: (*ORGANIC NITROGEN COMPOUNDS, *FREE RADICALS), (*RADIATION CHEMISTRY, ORGANIC NITROGEN COMPOUNDS), GAMMA RAYS, ELECTRON PARAMAGNETIC RESONANCE, HEAT OF ACTIVATION (U)

THE ESR OF CARBAZIDE (NH2NHCONHNH2) AFTER GAMMA IRRADIATION AT 77K EXHIBITS SIGNALS CORRESPONDING TO AN EFFECTIVE G VALUE OF 4 IN ADDITION TO THE COMPONENTS CENTERED AT G=2. THESE HALF-FIELD LINES CORRESPOND TO SECOND-ORDER DELTA MS=PLUS OR MINUS 2 TRANSITIONS OF A SPIN TRIPLET STATE WHICH RESULT FROM ISOTROPIC EXCHANGE COUPLINGS OF ELECTRONIC SPIN CENTERS LOCATED ON TWO NH FRAGMENTS. THERE ARE TWO DISTINGUISHABLE BIRADICAL ORIENTATIONS FOR WHICH SEPARATE SPECTRA OCCUR. EXCEPT FOR THIS DIFFERENCE IN ORIENTATION THE BIRADICALS ARE IDENTICAL. IN ADDITION TO THE BIRADICALS, OTHER UNIDENTIFIED RADICALS HAVING ONLY ONE UNPAIRED ELECTRON ARE OBSERVED. ANALYSIS OF THE TEMPERATURE DEPENDENCE OF THE BIRADICAL HALF-LIFE BY ISOTHERMAL ANNEALING GAVE THE ACTIVATION ENERGY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 744 744 7/5
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POLYMER PRODUCTION IN THE RADIOLYSIS OF MEDICINE, ETHANE, AND ETHYLENE SOLUTIONS IN LIQUID ARGON. (U)

MAY 71 6P SHERIDAN,MICHAEL E. ;GREER, EDWARD ;LIBBY,W. F. ;
CONTRACT: AF-AFOSR-1255-67
PROJ: AF-9538
MONITOR: AFOSR TR-72-1240

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF THE AMERICAN CHEMICAL SOCIETY, V94 N8 P2614-2618 1972.

DESCRIPTORS: (*HYDROCARBONS, *RADIATION CHEMISTRY), ETHYLENES, METHANE, GAMMA RAYS, LIQUEFIED GASES, ARGON (U)
IDENTIFIERS: LIQUID ARGON, RADIOLYSIS, IONIZING RADIATION (U)

FURTHER STUDIES OF THE PRODUCTS OF RADIOLYSIS OF SOLUTIONS OF METHANE, ETHANE, AND ETHYLENE IN LIQUID ARGON HAVE BEEN MADE. EARLIER WORK LEFT THE QUESTION OF MECHANISM SOMEWHAT UNANSWERED. THE ADDITIONAL DATA SEEM TO SHOW THAT THE MOST PROBABLE MECHANISM IS IONIZATION OF THE SOLUTES WITH LOWEST IONIZATION POTENTIAL BY ELECTRON TRANSFER TO THE ARGON IONS INITIALLY PRODUCED BY THE GAMMA RAYS AND SUBSEQUENT ION MOLECULE REACTIONS AND NEUTRALIZATION TO FORM THE HEAVY HYDROCARBONS. THE LIMIT ON MOLECULAR WEIGHT IS SUGGESTED TO BE AN ENERGETIC ONE IN WHICH FURTHER GROWTH OF THE POLYMER ION IS ENERGETICALLY FORBIDDEN. CHARGE-TRANSFER RECHARGES THE POLYMER WHEN IT IS NEUTRALIZED AND THIS IS THOUGHT TO HAPPEN SEVERAL TIMES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 746 586 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

ENERGY LEVEL STRUCTURE OF TRAPPED ELECTRONS IN METHYLTETRAHYDROFURAN GLASS FROM PHOTOCONDUCTIVITY AND OPTICAL BLEACHING STUDIES, (U)

JAN 72 11P HUANG,TIMOTHY ;EISELE,IGNATZ ;LIN,D. P. ;KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
MONITOR: AFOSR TR-72-1429

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL PHYSICS, V56 N9 P4702-4710, 1 MAY 72.

DESCRIPTORS: (*FURANS, *RADIATION CHEMISTRY), ELECTRONS, ORGANIC SOLVENTS, MOLECULAR ORBITALS, ELECTRON TRANSITIONS, RADIATION CHEMISTRY, PHOTOCONDUCTIVITY, PARAMAGNETIC RESONANCE, EXCITATION, CRYOGENICS (U)
IDENTIFIERS: *MATRIX ISOLATION TECHNIQUES, *TRAPPED ELECTRONS, ELECTRON PARAMAGNETIC RESONANCE (U)

ELECTRONS ARE TRAPPED IN GAMMA-IRRADIATED METHYLTETRAHYDROFURAN (MTHF) GLASS AT 77K. MONOCHROMATIC PHOTOEXCITATION PRODUCES PHOTOCONDUCTIVITY AND OPTICAL BLEACHING WITH A THRESHOLD NEAR 780 NM (1.6 EV) AND A PEAK NEAR 520 NM (2.4 EV). THIS TRANSITION IS LINEAR IN LIGHT INTENSITY AND INDEPENDENT OF TEMPERATURE BETWEEN 77 AND 4.2K, SO IT IS INTERPRETED AS A ONE PHOTON TRANSITION DIRECTLY TO THE CONDUCTION BAND OR TO AN AUTOIONIZING STATE. EFFECTIVE DOUBLE BEAM PHOTOEXCITATION DISCLOSES A TWO PHOTON TRANSITION WHICH DEPENDS ON THE LIGHT INTENSITY SQUARED. THE DEDUCED ENERGY LEVEL STRUCTURE AGREES WELL WITH THEORETICAL CALCULATIONS BASED ON A SEMICONTINUUM MODEL FOR TRAPPED ELECTRONS IN GLASSY MATRICES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 749 566 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

MATRIX (ELECTRON NUCLEAR RESONANCE) ENDOR LINEWIDTHS OF TRAPPED ELECTRONS IN GLASSY MATRICES AT 77 K, (U)

FEB 72 9P HELBERT,JOHN ;KEVAN,LARRY ; BALES,BARNEY L. ;

CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
PROJ: AF-9750, DA-2-0-061102-B-13-B
TASK: 975002
MONITOR: AFOSR,AROD TR-72-1905,9999.1-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V57 N2 P723-729, 15 JUL 72.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SAN FERNANDO VALLEY STATE COLL., NORTHRIDGE, CALIF. DEPT. OF PHYSICS.

DESCRIPTORS: (*CARBINOLS, *RADIATION CHEMISTRY), (*FURANS, RADIATION CHEMISTRY), MATRICES(MATHEMATICS), BAND THEORY OF SOLIDS, WAVE FUNCTIONS, ELECTRONS, ELECTRON PARAMAGNETIC RESONANCE, THEORY, CRYOGENICS (U)
IDENTIFIERS: TETRAHYDROFURAN/2-METHYL, *TRAPPED ELECTRONS, *ELECTRON NUCLEAR DOUBLE RESONANCE, ELECTRON PARAMAGNETIC RESONANCE (U)

MATRIX ENDOR LINES OF PROTONS ASSOCIATED WITH TRAPPED ELECTRONS IN GAMMA-IRRADIATED GLASSY MATRICES OF 10M NAOH, METHANOL AND 2-METHYLTETRAHYDROFURAN AT 77K HAVE BEEN OBSERVED. BY ANALYSIS OF THE MATRIX ENDOR LINE SHAPES UNDER COMPARABLE EXPERIMENTAL CONDITIONS THE LINEWIDTH HAS BEEN RELATED TO THE SPATIAL EXTENT OF THE GROUND STATE WAVEFUNCTION OF THE TRAPPED ELECTRON. THESE EXPERIMENTAL RESULTS ARE COMPARED WITH PREDICTION OF THE SEMICONTINUUM MODEL FOR TRAPPED ELECTRONS AND FOUND TO BE IN GOOD AGREEMENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 749 567 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

APPLICATION OF THE SEMICONTINUUM MODEL TO THE EFFECT OF DIPOLE REORIENTATION ON TRAPPED ELECTRON SPECTRA IN GLASSY ETHANOL, (U)

JAN 72 9P FUEKI,KENJI ;FENG,DA FEI ; KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-72-1906

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS, V56 N11 P5351-5357, 1 JUN 72.

DESCRIPTORS: (*ETHANOLS, *RADIATION CHEMISTRY), ELECTRONS, ORGANIC SOLVENTS, DIPOLE MOMENTS, MOLECULAR ORBITALS, CRYOGENICS, EXCITATION (U)
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, *TRAPPED ELECTRONS (U)

A SEMICONTINUUM MODEL IS APPLIED TO TRAPPED ELECTRONS IN GLASSY ETHANOL AT 77K. THE CONFIGURATIONAL STABILITY OF THE GROUND STATE HAS BEEN ESTABLISHED. GROUND, EXCITED, AND CONTINUUM STATES ARE CALCULATED SELF-CONSISTENTLY FOR SPECIFIED ORIENTATIONS FROM 80 TO 0 DEG. OF THE MOLECULAR DIPOLES WITH RESPECT TO THE TRAPPED ELECTRON. IT IS SHOWN THAT THE SPECTRAL SHIFTS OBSERVED FOR TRAPPED ELECTRONS IN PULSE RADIOLYSIS EXPERIMENTS ON ALCOHOL GLASSES AND THE SHIFTS OBSERVED UPON WARMING FROM 4 TO 77K AFTER GAMMA IRRADIATION AT 4K CAN BE SEMIQUANTITATIVELY ACCOUNTED FOR BY THE MOLECULAR DIPOLE ORIENTATION MECHANISM. THE EFFECT OF DIPOLE ORIENTATION UPON OTHER PHYSICAL PROPERTIES OF THE TRAPPED ELECTRONS IN ETHANOL IS ALSO DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 751 324 7/5
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

PULSE RADIOLYSIS OF PENICILLAMINE IN AQUEOUS SOLUTION: THE THIYL RADICAL AND THE DISULPHIDE RADICAL ANION, (U)

JUN 71 4P PURDIE,J. W. ;GILLIS,H. A. ;KLASSEN,N. V. ;
MONITOR: DREO 645

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL COMMUNICATIONS, P1163-1165 1971. (COM. 1059).

DESCRIPTORS: (*ORGANIC SULFUR COMPOUNDS, *FREE RADICALS), (*RADIATION CHEMISTRY, ORGANIC SULFUR COMPOUNDS), ELECTRON IRRADIATION, ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, IONS, AMINES, AMINO ACIDS, REACTION KINETICS, PH FACTOR, CANADA, SOLUTIONS(MIXTURES), ABSORPTION SPECTRA (U)
IDENTIFIERS: MERCAPTANS, MOLECULAR IONS, *ORGANIC SULFIDES, *PENICILLAMINE, *PULSE RADIOLYSIS, *ION RADICALS, DISULFIDE ORGANIC COMPOUNDS (U)

IT HAS BEEN SHOWN THAT THE THIYL RADICALS PRODUCED BY PULSE RADIOLYSIS OF AQUEOUS SOLUTIONS OF MERCAPTANS COMBINE WITH THE SULPHYDRYL ANION TO GIVE A RADICAL ANION COMPLEX. RS RADICAL + RS(-) = RSSR(-). THE SAME TRANSIENT HAS BEEN PRODUCED FROM DISULPHIDES BY ADDITION OF SOLVATED ELECTRONS: RSSR + E(-)(AQ) GOES TO RSSR(-). IN BOTH CASES THE THIYL RADICALS EVENTUALLY COMBINE TO GIVE DISULPHIDE: RS RADICAL + RS RADICAL GOES TO RSSR. THE AUTHORS HAVE INVESTIGATED THE TRANSIENTS PRODUCED BY PULSE RADIOLYSIS OF PENICILLAMINE, HO2CCH(NH2)C(CH3)2SH, IN AQUEOUS SOLUTIONS AND HAVE OBSERVED BOTH THE RS RADICAL AND THE RSSR(-) RADICAL ANION DIRECTLY. SPECTRA WERE MEASURED WITH A SPLIT LIGHT-BEAM SYSTEM AND ARE DISCUSSED HERE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 751 328 7/5 6/18 6/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOLOGY

INVESTIGATION OF CHAIN REACTIONS AND OXYGEN EFFECTS DURING RADIOLYSIS OF PEPTIDE DISULFIDE BONDS USING CYSTEINE-GLUTATHIONE DISULFIDE AS A MODEL, (U)

JUN 71 11P PURDIE,J. W. ;
MONITOR: DREO 647

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN RADIATION RESEARCH, V48 N3 P474-483 DEC 71.

DESCRIPTORS: (*ORGANIC SULFUR COMPOUNDS, *RADIATION CHEMISTRY), (*FREE RADICALS, ORGANIC SULFUR COMPOUNDS), GLUTATHIONE, AMINO ACIDS, OXYGEN, GAMMA RAYS, DIFFUSION, SOLUTIONS(MIXTURES), REACTION KINETICS, CANADA, RADIOBIOLOGY, PEPTIDES (U)
IDENTIFIERS: MOLECULAR IONS, ORGANIC SULFIDES, CHAIN REACTIONS, RADIOLYSIS, CYSTEINE, DISULFIDE ORGANIC COMPOUNDS (U)

GAMMA-RADIOLYSIS OF CYSTEINE-GLUTATHIONE DISULFIDE, THE MIXED DISULFIDE OF CYSTEINE AND THE TRIPEPTIDE GLUTATHIONE, HAS BEEN EXAMINED IN UNBUFFERED AQUEOUS SOLUTIONS (0.3 MM). IN THE PRESENCE OF AIR THE PRINCIPAL PRODUCTS ARE SULFINIC AND SULFONIC ACIDS OF CYSTEINE AND GLUTATHIONE AND THE SYMMETRICAL DISULFIDES, CYSTINE AND GLUTATHIONE DISULFIDE. IN THE ABSENCE OF AIR, CYSTEINE, GLUTATHIONE, AND THE SULFINIC ACID DERIVATIVES OF THESE THIOLS WERE PRODUCED. IRRADIATION OF SOLUTIONS CONTAINING VARIOUS CONCENTRATIONS OF MIXED DISULFIDE AND A RANGE OF OXYGEN CONCENTRATIONS SHOWED THAT THE HIGH YIELDS OF SYMMETRICAL DISULFIDES WERE DUE TO A CHAIN REACTION WHICH COULD BE SUPPRESSED BY OXYGEN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 751 481 7/5 11/9
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. II. GAMMA-INITIATED OXIDATIONS OF ATACTIC POLYPROPYLENE. (U)

DESCRIPTIVE NOTE: REPT. NO. 11 (FINAL), 1 MAY 71-31 AUG 72,
AUG 72 46P DECKER,CHRISTIAN ;MAYO,FRANK R. ;
CONTRACT: DAHC04-72-C-0007
PROJ: SRI-8012-1, SRI-8012-2
MONITOR: AROD 8255:5-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-751 482 AND AD-751 480. ALSO INCLUDES REPT. NO. 9.

DESCRIPTORS: (*POLYMERS, *DECOMPOSITION), (*OXIDATION, POLYMERS), (*RADIATION CHEMISTRY, POLYMERS), GAMMA RAYS, FREE RADICALS, REACTION KINETICS, ALCOHOLS, KETONES, PEROXIDES (U)
IDENTIFIERS: *OLEFINS, *ATACTIC POLYMERS, CAGE EFFECT(CHEMISTRY), CHEMICAL REACTION MECHANISMS, *POLYPROPYLENE (U)

THE STUDY PRESENTS THE RATES AND PRODUCTS OF OXIDATION OF AMORPHOUS POLYPROPYLENE (PP) AS INITIATED BY THE ACTION OF GAMMA RAYS, FOR COMPARISON WITH THE DI-T-BUTYLPEROXY OXALATE (DBPO)-INITIATED OXIDATIONS OF PP AND WITH THE GAMMA-INITIATED OXIDATIONS OF POLYETHYLENE AND ETHYLENE-PROPYLENE COPOLYMERS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 751 482 7/5 11/9
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. III. POLYETHYLENE AND ETHYLENE-PROPYLENE COPOLYMERS. (U)

DESCRIPTIVE NOTE: REPT. NO. 10 (FINAL), DEC 70-31 AUG 72,
AUG 72 29P DECKER,CHRISTIAN ;MAYO,FRANK R. ;RICHARDSON,HAROLD ;
CONTRACT: DAHC04-72-C-0007
PROJ: SRI-8012-2
MONITOR: AROD 8255:7-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-751 483 AND AD-751 481.

DESCRIPTORS: (*POLYMERS, *DECOMPOSITION), (*OXIDATION, POLYMERS), (*RADIATION CHEMISTRY, POLYMERS), (*POLYETHYLENE PLASTICS, OXIDATION), MOLECULAR STRUCTURE, REACTION KINETICS, GAMMA RAYS, ALCOHOLS, KETONES, MOLECULAR STRUCTURE (U)
IDENTIFIERS: *OLEFIN RESINS, *POLYPROPYLENE, *ETHYLENE PROPYLENE COPOLYMERS (U)

REPORTED IS A COMPARISON OF THE EFFECTS OF CHANGES IN STRUCTURE AND DEGREE OF CRYSTALLINITY ON OXIDATIONS OF POLYETHYLENE (PE), ETHYLENE-PROPYLENE COPOLYMERS (EP), AND POLYPROPYLENE (PP) AT THE SAME RATES OF GAMMA-INITIATION AT 45C. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 752 645 7/5
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

THERMALLY STIMULATED CONDUCTIVITY OF GAMMA-IRRADIATED TRIETHYLAMINE AND 3-METHYLPENTANE GLASSES, (U)

JAN 72 6P MUNJAL,ASHOK K. ;KEVAN, LARRY ;
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-72-2267

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V76 P2781 1972.

DESCRIPTORS: (*RADIATION CHEMISTRY, THERMAL CONDUCTIVITY), (*AMINES, RADIATION CHEMISTRY), ELECTRONS, CRYOGENICS, ELECTRICAL CONDUCTIVITY (U)
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, RADIOLYSIS, *TRAPPED ELECTRONS, TRIETHYLAMINE (U)

THERMALLY STIMULATED CONDUCTIVITY OF 60CO GAMMA-IRRADIATED AND UNIRRADIATED TRIETHYLAMINE WAS STUDIED AS THE GLASSY MATRIX WAS WARMED FROM 77K. THE UNIRRADIATED MATRIX GIVES A PEAK NEAR 117K WHICH CAN BE REMOVED BY FIELD ORIENTATION UPON FREEZING THE MATRIX. THE IRRADIATED MATRIX GIVES EVIDENCE FOR THREE DIFFERENT TYPES OF RADIATION-PRODUCED SPECIES AS INDICATED BY CONDUCTIVITY PEAKS IN DIFFERENT TEMPERATURE RANGES. A FEW EXPERIMENTS WERE ALSO CARRIED OUT ON GLASSY 3-METHYLPENTANE TO COMPARE WITH TWO PUBLISHED STUDIES OF THERMALLY STIMULATED CONDUCTIVITY IN THIS MATRIX WHICH ARE DIVERGENT. OUR RESULTS CONFIRM THOSE OF WISEALL AND WILLARD. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 753 652 7/5
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC CHEMISTRY

GAMMA-RADIOLYSIS OF TERTIARY AROMATIC AMINES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 OCT 71-30 SEP 72,
OCT 72 14P KHANDELWAL,G. D. ;SWAN,G. A. ;
CONTRACT: DAJA37-72-C-1546
PROJ: DA-2-0-061102-B-13-B
MONITOR: ARDG(E) E-1371

UNCLASSIFIED REPORT

DESCRIPTORS: (*AMINES, *RADIATION CHEMISTRY), (*NITROGEN HETEROCYCLIC COMPOUNDS, RADIATION CHEMISTRY), GAMMA RAYS, FREE RADICALS, PIPERIDINES, GREAT BRITAIN (U)
IDENTIFIERS: AZEPINES, *RADIOLYSIS (U)

EARLIER RESEARCH ON THE GAMMA-RADIOLYSIS OF 1-PHENYLPIPERIDINE HAS BEEN EXTENDED TO GIVE EVIDENCE OF THE FORMATION OF THE ENAMINE 1-PHENYL-2-PIPERIDEINE AS AN INTERMEDIATE. THUS, IRRADIATION OF THE AMINE IN THE PRESENCE OF N-PHENYLMALEIMIDE YIELDS 1,2,3,4,5,6-HEXAHYDRO-4AH-BENZO (C)QUINOLIZINE-5-6-N-PHENYLDICARBOXIMIDE; BUT IF THE AMINE IS FIRST IRRADIATED IN THE PURE STATE, AND SUBSEQUENTLY TREATED WITH N-PHENYLMALEIMIDE, AN ISOMERIC PRODUCT IS OBTAINED. GAMMA-RADIOLYSIS OF, OR REACTION OF T-BUTOXY RADICALS WITH 1-PHENYLHEXAHYDROAZEPINE YIELDS THE RADICAL COUPLING DIMER 1,1'DIPHENYLDODECAHYDRO-2,2'-BIAZEPINE. A NUMBER OF 2-ARYLHEXAHYDROISOINDOLINES AND 2-P-TOLYLOCTAHYDROCYCLOPENTA (C)PYRROLE WERE ALSO PREPARED. REACTION OF COMPOUNDS WITH T-BUTOXY RADICALS AFFORDED DIMERIC PRODUCTS ANALOGOUS TO ONE OBTAINED FROM 1-PHENYLPYRROLIDINE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 753 917 7/5 18/8
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

SPECTRAL IDENTIFICATION OF COMPOUNDS FORMED BY NUCLEAR RADIATION IN AIR FOR REMOTE FALLOUT SURVEY. (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT TECHNICAL REPT.,
NOV 72 22P HARMATZ,MILTON ;
REPT. NO. ECOM-4053
PROJ: DA-1-T-061102-B-11-A
TASK: 1-T-061102-B-11-A-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIATION CHEMISTRY, *AIR), (*NITROGEN OXIDES, RADIATION CHEMISTRY), INFRARED SPECTRA, ALPHA PARTICLES, FALLOUT, POLONIUM, COBALT (U)
IDENTIFIERS: NITROGEN OXIDE(N20), NITROGEN OXIDE(N02), COBALT 60, POLONIUM 210, IONIZING RADIATION (U)

MEASUREMENTS OF THE NITROGEN COMPOUND FORMATION PRODUCED BY IONIZING IRRADIATION ON AIR AT 300K AND 760 MMHG ARE REPORTED. INFRARED SPECTROPHOTOMETRY MEASUREMENTS OF DRY AIR EXPOSED TO 0.230 CURIE POLONIUM-210 SHOWED THAT NITROUS OXIDE AND NITROGEN PENTOXIDE WERE THE INITIAL PRODUCT FORMED. THERE WERE INDICATIONS THAT THE DECOMPOSITION OF THE NITROGEN PENTOXIDE FOLLOWING 25 HOURS OF EXPOSURE ENHANCED THE GROWTH OF NITROGEN DIOXIDE. THROUGHOUT THE IRRADIATION PERIOD, NITROUS OXIDE WAS A MAJOR AND THE MOST STABLE CONSTITUENT PEAK. INFRARED SPECTRA OF AIR EXPOSED TO LOWER ACTIVITY VALUES 0.115 AND 0.050 CURIE ALSO EXHIBITED NITROUS OXIDE AS A DOMINANT CONSTITUENT. THE RESULTS OBTAINED FROM IRRADIATING AIR WITH THE THREE ALPHA PARTICLE SOURCES INDICATED THAT THE FORMATION OF NITROUS OXIDE AND NITROGEN DIOXIDE WAS DOSE RATE DEPENDENT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 754 145 6/1
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE VA

INVESTIGATION OF THE PARAMAGNETIC CENTERS OF THE IRRADIATED PROTEINS, (U)

NOV 72 243P KAYUSHIN,L. P. ;LVOV,K. M. ;PULATOVA,M. K. ;
REPT. NO. FSTC-HT-23-324-71
PROJ: FSTC-T7023012301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. PRIRODA PARAMAGNITNYKH TSENTROV V Y-OBLUCHENNOM GLITSINE, MOSCOW, 1970 239P.

DESCRIPTORS: (*PROTEINS, *RADIATION CHEMISTRY), (*PARAMAGNETIC RESONANCE, PROTEINS), FREE RADICALS, AMINO ACIDS, PEPTIDES, GAMMA RAYS, GLYCINE, MOLECULAR STRUCTURE, IONIZATION, HARTREE-FOCK APPROXIMATION, MOLECULAR ORBITALS, CHEMICAL BONDS, MOLECULAR ASSOCIATION, USSR (U)
IDENTIFIERS: IONIZING RADIATION, TRANSLATIONS (U)

EXPERIMENTAL DATA ON PARAMAGNETIC CENTERS OCCURRING IN BIOLOGICALLY IMPORTANT COMPOUNDS AS A RESULT OF RADIATION ARE SYSTEMATIZED. MUCH OF THE REPORT IS DEVOTED TO ANALYSIS OF THE ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF FREE RADICALS FORMED BY GAMMA-RAYS IN AMINO ACIDS AND PEPTIDES. THE RESULTS OF INVESTIGATION OF THE PARAMAGNETIC RESONANCE OF RADIATION DISRUPTIONS IN PROTEINS ARE PRESENTED. ANALYSIS OF THE PARAMAGNETIC CENTERS OF IRRADIATED BIOPOLYMERS OF DIFFERENT SPATIAL STRUCTURE AND UNDER DIFFERENT PHYSICAL CONDITIONS MADE IT POSSIBLE IN MANY CASES TO TRACE THE PATH BY WHICH THE TRANSFER AND EXCHANGE OF ENERGY OF ABSORBED RADIATION PROCEED IN MOLECULES OF BIOLOGICAL SYSTEMS, AND TO OBTAIN INFORMATION ON THE UNIQUE STRUCTURE OF BIOPOLYMERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 760 233 7/5
BRITISH COLUMBIA UNIV VANCOUVER DEPT OF CHEMISTRY

NANOSECOND PULSE RADIOLYSIS TECHNIQUES FOR THE STUDY OF LIQUIDS USING A 600 KV FEBETRON, (U)

SEP 71 18P KENNEY-WALLACE,G. A. ; SHAEDE,E. A. ;WALKER,D. C. ;WALLACE,S. C. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN INTERNATIONAL JNL. RADIATION PHYSICS AND CHEMISTRY.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 5 JUL 71.

DESCRIPTORS: (*RADIATION CHEMISTRY, *ELECTRON ACCELERATORS), LIQUIDS, FLUORESCENCE, ADSORPTION, REACTION KINETICS, LABORATORY EQUIPMENT, DESIGN, CANA(U)
IDENTIFIERS: *RADIOLYSIS (U)

SOME OF THE WAYS IN WHICH A 600 KV FEBETRON ELECTRON ACCELERATOR HAS BEEN ADAPTED TO NANOSECOND PULSE RADIOLYSIS STUDIES OF LIQUIDS ARE OUTLINED UNDER FOUR CATEGORIES: (1) EMISSION SPECTROSCOPY DURING THE PULSE AND WHEN THE MEDIUM SHOWS STRONG SELF-ABSORPTION OF ITS OWN FLUORESCENCE, (2) INSTANTANEOUS ABSORPTION SPECTROSCOPY USING AN INTERNAL CERENKOV LIGHT SOURCE; THIS HAS BEEN DEMONSTRATED BY SPECTROGRAPHIC AND SPECTROPHOTOMETRIC METHODS AND THE SENSITIVITY IS SUCH THAT STRONGLY ABSORBING SPECIES HAVING LIFETIMES AS SHORT AS 3 X 10 TO THE -11 POWER S MAY BE DETECTED, (3) VERY FAST KINETIC STUDIES USING LASER PHOTOMETRY FOR MONITORING PURPOSES AND USING THE MAXIMUM DOSE RATES, (4) A COMBINED FLASH PHOTOLYSIS-PULSE RADIOLYSIS ARRANGEMENT IN WHICH PART OF THE ELECTRON BEAM IS USED FOR RADIOLYSIS AND THE REST TO STIMULATE A NANOSECOND LIGHT FLASH IN A SILVERED HEMISPHERICAL SCINTILLATOR SURROUNDING THE IRRADIATION CELL. ADVANTAGES OF THE VERY INTENSE AND SHORT ELECTRON PULSE ARE DISCUSSED TOGETHER WITH THE PROBLEMS ASSOCIATED WITH WEAK PENETRATION OF 600 KV ELECTRONS. SOME EXPERIMENTAL DETAILS ARE GIVEN INCLUDING METHODS OF DOSIMETRY. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 763 492 7/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE VA

RADIOLYSIS OF CRYSTALLINE AZIDES, BROMATES AND NITRATES (RADIOLIZ KRISTALLICHESKIKH AZIDOV, BROMATOV I NITRATOV), (U)

JAN 73 20P BOLDYREV,V. V. ;
REPT. NO. FSTC-HT-23-445-73
PROJ: FSTC-T7023012301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF INTERNATIONAL JNL. FOR RADIATION PHYSICS AND CHEMISTRY (ENGLAND) V3 N2 P155-169 1971.

DESCRIPTORS: (*AZIDES, RADIATION CHEMISTRY), (*NITRATES, RADIATION CHEMISTRY), (*ALKALI METAL COMPOUNDS, *RADIATION CHEMISTRY), THERMAL STABILITY, BROMINE COMPOUNDS, REACTION KINETICS, SALTS, USSR (U)
IDENTIFIERS: *BROMATES, RADIOLYSIS, TRANSLATIONS (U)

RADIATION STABILITY OF CRYSTALLINE AZIDES, BROMATES AND NITRATES OF ALKALI METALS AT ROOM TEMPERATURE HAS BEEN COMPARED WITH THEIR THERMAL STABILITY. THE OBSERVED CHANGE IN RADIATION YIELD IS EXPLAINED BY CONSIDERING A RELATION BETWEEN RADIATION FRAGMENT AND FREE VOLUME. THE NECESSITY OF SEARCH FOR NEW WAYS OF USING RADIATION FOR SOLVING APPLIED PROBLEMS, ON ONE HAND, AND THE NECESSITY OF SEARCH FOR METHODS OF RAISING RADIATION STABILITY OF MATERIALS, USED IN VARIOUS BRANCHES OF SCIENCE AND TECHNOLOGY, ON THE OTHER HAND, ARE THE CAUSES LEADING TO INCREASING INTEREST OF MANY RESEARCH WORKERS IN THE STUDY OF RADIATION-CHEMICAL PROCESSES IN SOLID BODIES AND THEIR PHYSICO-CHEMICAL PROPERTIES CAUSED BY IRRADIATION. THE BASIC RESULTS OBTAINED DURING MANY YEARS OF RESEARCH IN OUR LABORATORY IN THIS DIRECTION, IS PRESENTED IN THIS ARTICLE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 776 827 7/5
CALIFORNIA INST OF TECH PASADENA GATES AND CRELLIN LABS OF CHEMISTRY

EXCITED STATE FORMATION IN THE IRRADIATION OF 1, 3-CYCLOHEXADIENE, (U)

71 13P PENNER,THOMAS L. ;HAMMOND, GEORGE S. ;
REPT. NO. CONTRIB-4094
CONTRACT: AF-49(638)-1479
PROJ: AF-9538
MONITOR: AFOSR TR-74-0395

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ORGANIC SCINTILLATORS AND LIQUID SCINTILLATION COUNTING, P327-337 1971.

DESCRIPTORS: *RADIATION CHEMISTRY, IRRADIATION, EXCITATION, DIMERS, CYCLOHEXENES, MOLECULAR ENERGY LEVELS, GAMMA RAYS, REACTION KINETICS, ENERGY TRANSFER (U)
IDENTIFIERS: *CYCLOHEXADIENE COMPOUNDS, *DIMERIZATION, CHEMICAL REACTION MECHANISMS (U)

IRRADIATION OF 1,3-CYCLOHEXADIENE WITH HIGH ENERGY RADIATION LEADS TO DIMERIZATION. RELATIVE AMOUNTS OF THESE DIMERS VARY WIDELY WITH REACTION CONDITIONS BUT THE COMPOSITION OF THE MIXTURES CAN BE EXPRESSED IN TERMS OF VARIABLE AMOUNTS OF TWO GROUPS EACH OF WHICH CONTAINS THE DIMERS IN A FIXED PROPORTION. THE EVIDENCE INDICATES THAT ONE OF THESE GROUPS ARISES FROM DIMERIZATION OF THE CYCLOHEXADIENE CATION AND THAT THE OTHER ORIGINATES FROM DIENE TRIPLETS. THE LATTER IN TURN APPEAR TO BE PRODUCED BY NEUTRALIZATION OF IONS. SINGLET PRODUCT, 1, 3, 5-HEXATRIENE, IS ALSO FORMED BUT IS NOT IONIC IN ORIGIN. THE EFFECT OF A CHANGE IN LINEAR ENERGY TRANSFER ON THE RADIATION PROCESSES IS ALSO INVESTIGATED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 779 632 7/5 7/3
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. III. POLYETHYLENE AND ETHYLENE-PROPYLENE COPOLYMERS, (U)

JUN 73 22P DECKER,CHRISTIAN ;MAYO,FRANK R. ;RICHARDSON,HAROLD ;
CONTRACT: DAHC04-72-C-0007
MONITOR: AROD 8255.10-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF POLYMER SCIENCE: POLYMER CHEMISTRY EDITION, V11 P2879-2898 1973.
SUPPLEMENTARY NOTE: SEE ALSO AD-751 482 AND AD-779 633.

DESCRIPTORS: *POLYETHYLENE, *POLYPROPYLENE, *OXIDATION, *RADIATION CHEMISTRY, GAMMA RAYS, REACTION KINETICS, THIN FILMS, FREE RADICALS (U)
IDENTIFIERS: COPOLYMERS, OLEFIN RESINS (U)

RATES OF OXYGEN ABSORPTION AND FORMATION OF OXIDATION PRODUCTS WERE DETERMINED IN GAMMA-INITIATED OXIDATIONS OF THIN FILMS OF HIGH- AND LOW-DENSITY POLYETHYLENE, ATACTIC AND ISOTACTIC POLYPROPYLENE, AND OF THREE ETHYLENE-PROPYLENE COPOLYMERS. RADIATION YIELDS G FOR O2 ABSORBED AND FORMATION OF HYDROPEROXIDES DEPEND ON DOSE RATES AND DECREASE SHARPLY WITH INCREASING ETHYLENE CONTENT OF THE COPOLYMERS AND MODERATELY WITH INCREASING CRYSTALLINITY OF ANY BASE POLYMER. G VALUES FOR DIALKYL PEROXIDE AND CARBONYL FORMATION, AND THEREFORE FOR CHAIN INITIATION AND TERMINATION, DO NOT CHANGE MUCH WITH POLYMER COMPOSITION AND CRYSTALLINITY AND NOT AT ALL WITH DOSE RATES. A FEW EXPERIMENTS WITH ATACTIC POLYPROPYLENE AND AN AMORPHOUS ETHYLENE-PROPYLENE COPOLYMER, INITIATED BY DI-TERT-BUTYLPEROXY OXALATE, INDICATE THAT 37 MOLE-% OF ETHYLENE IN THE POLYMER INCREASES THE EFFICIENCY OF INITIATION AND THE TENDENCY TOWARD CROSSLINKING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 780 613 7/5 7/4
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

PROPERTIES OF ENERGETIC IONS TRAPPED IN SOLIDS OF INTEREST AS FUTURE ENERGY SOURCES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 OCT 69-30 SEP 73, DEC 73 31P KEVAN,LARRY ;
CONTRACT: AF-AFOSR-1852-70
PROJ: AF-9750
TASK: 975002
MONITOR: AFOSR TR-74-0800

UNCLASSIFIED REPORT

DESCRIPTORS: *IONS, *RADIATION CHEMISTRY, GLASS, ELECTRONS, ELECTRON MOBILITY, SCIENTIFIC RESEARCH, ABSTRACTS, PHOTOIONIZATION, PHOTOCONDUCTIVITY, ICE, MAGNETIC PROPERTIES, ENERGY TRANSFER, ELECTRICAL CONDUCTIVITY, ATOMIC ENERGY LEVELS, ELECTRON PARAMAGNETIC RESONANCE, CHEMICAL RADICALS, RELAXATION, RADIOLYSIS (U)
IDENTIFIERS: *MATRIX ISOLATION TECHNIQUES, ELECTRON ELECTRON DOUBLE RESONANCE, ELECTRON NUCLEAR DOUBLE RESONANCE, *TRAPPED ELECTRONS, TRAPPED PARTICLES (U)

THIS IS A FINAL REPORT OF RESEARCH DESIGNED TO EXTEND THE KNOWLEDGE OF PRODUCTION, STORAGE AND UTILIZATION OF HIGHLY ENERGETIC CHEMICAL SPECIES. THE RESEARCH CONCENTRATED ON THE PHYSICAL AND CHEMICAL PROPERTIES OF RADIATION-PRODUCED IONS TRAPPED IN SOLID MATRICES. THE FIRST DEFINITIVE AND COMPREHENSIVE PICTURE OF TRAPPED ELECTRON ENERGY LEVELS IN GLASSY MATRICES EXTENDING OVER A BROAD RANGE OF POLARITY HAS BEEN OBTAINED FROM BOTH EXPERIMENTAL AND THEORETICAL STUDIES. MOBILITY MEASUREMENTS OF ELECTRONS IN CONDUCTION STATES OF GLASSY MATRICES HAVE ALLOWED THE IDENTIFICATION OF THE DOMINANT ELECTRON SCATTERING MECHANISMS. NEW METHODS INVOLVING ELECTRON-ELECTRON DOUBLE RESONANCE HAVE BEEN DEVELOPED TO STUDY MAGNETIC ENERGY TRANSFER BETWEEN IONS AND RADICALS IN DISORDERED SOLIDS. THE SPATIAL CORRELATION BETWEEN CATIONS AND ELECTRONS PRODUCED BY PHOTOIONIZATION HAS BEEN DEMONSTRATED TO DEPEND UPON THE PHOTOIONIZATION ENERGY. THESE STUDIES LAY THE GROUNDWORK FOR CHARACTERIZING THE STABILITY OF ION TRAPPING IN DISORDERED SOLIDS. INCLUDED ARE ABSTRACTS OF 34 PAPERS COMPLETED ON THIS PROJECT. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 785 971 7/4
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE VA

USE OF A CYCLOTRON TO STUDY THE RADATION CHEMISTRY OF SOLIDS, (U)

OCT 73 9P OBLIVANTSEV,A. N. ;LYKHIN, V. M. ;EREMIN,L. P. ;
REPT. NO. FSTC-HT-23-913-73

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF POLITEKHNICHESKII INSTITUT, TOMSK. IZVESTIYA (USSR) V176 P116-121 1970.

DESCRIPTORS: *RADIATION CHEMISTRY, *ALKALI METAL COMPOUNDS, *CYCLOTRONS, IONIZING RADIATION, PROTONS, TRANSLATIONS, USSR (U)

DURING THE LAST FIVE YEARS, WORK HAS BEEN PERFORMED USING THE CYCLOTRON OF THE SCIENTIFIC RESEARCH INSTITUTE OF NUCLEAR PHYSICS AT THE TPI, TO STUDY THE RADIO-CHEMICAL STABILITY OF IONIZED CRYSTALS UNDER THE ACTION OF A PROTON BEAM ESCAPING INTO THE ATMOSPHERE. AS TARGET, AZIDES, NITRATES, PERCHLORATES AND PERMANGANATES OF ALKALI METALS WERE USED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 787 531 7/5 7/3 7/4
RICHMOND COLL STATEN ISLAND N Y

RADIATION EFFECTS IN CROSSLINKING IN POLYMERIC SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. NO. 10, 1 OCT 68-31 JUL 74 (FINAL),
SEP 74 8P ODIAN,GEORGE ;
CONTRACT: DA-ARO(D)-31-124-G1063
MONITOR: AROD 7923.1-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: *RADIATION CHEMISTRY, SCIENTIFIC RESEARCH, REACTION KINETICS, DIFFUSION, FILMS, POLYMERIZATION (U)
IDENTIFIERS: *GRAFT POLYMERIZATION (U)

THE PAPER OUTLINES RESEARCH FINDINGS ON A PROJECT INVOLVING THE ELUCIDATION OF THE PROCESS OF RADIATION-INDUCED GRAFT POLYMERIZATION OF MONOMER TO POLYMER. THE QUANTITATIVE INTERRELATIONSHIPS OF THE INITIATION RATE, THE K(P)/(K(+) TO THE 1/2 POWER) RATIO FOR THE MONOMER, THE EQUILIBRIUM SOLUBILITY OF THE MONOMER IN THE POLYMER, THE POLYMER FILM THICKNESS, THE REACTION TIME, AND THE DIFFUSIVITY OF THE MONOMER IN THE POLYMER WERE INVESTIGATED. WORK ON THE PROJECT HAS GIVEN A MATHEMATIC ANALYSIS OF THE GRAFTING REACTION AND ITS EXACT DEPENDENCE ON THESE FACTORS. EQUATIONS SHOW QUANTITATIVELY HOW THE VARIOUS PARAMETERS IN ANY GRAFTING SYSTEM INTERACT TO LEAD TO DIFFUSION-CONTROLLED GRAFT POLYMERIZATION. (U)

AD-A047 350 DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA F/G 7/5
RADIATION CHEMISTRY.(U)
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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 836 970 7/5 11/9 7/3
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

RADIATION-INDUCED POLYMERIZATION OF POLYFUNCTIONAL VINYLSILOXANE, (U)

68 9P KONOBEEVSKII,K. S. ; GUSSELNIKOV,L. E. ;NAMETKIN,N. S. ;POLAK,L. S. ;CHERNYSHEVA,T. I. ;
REPT. NO. FSTC-HT-23-273-68
TASK: 8223627-23.01

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE SOEDINENIYA (USSR) V8 N3 P553-556 1966, BY GEORGE G. WEICKHARDT.

DESCRIPTORS: (*SILOXANES, POLYMERIZATION), (*POLYMERIZATION, *RADIATION CHEMISTRY), SILICONE PLASTICS, SYNTHESIS(CHEMISTRY), DECOMPOSITION, COPOLYMERIZATION, GELS, INFRARED SPECTROSCOPY, PARAMAGNETIC RESONANCE, CROSSLINKING(CHEMISTRY), USSR(U)
IDENTIFIERS: GRAFT COPOLYMERS, RADIOLYSIS, TRANSLATIONS (U)

IT WAS PREVIOUSLY DEMONSTRATED THAT POLYFUNCTIONAL VINYLSILOXANES WERE POLYMERIZED BY RADIATION, FORMING HIGH MOLECULAR POLYMERS. ON EXAMINATION OF THE MOLECULAR WEIGHTS AND CHARACTERISTIC VISCOSITIES OF THESE POLYMERS THE HYPOTHESIS THAT POLYMER MOLECULES ARE SOLUBLE MICROGELS WAS ARRIVED AT. THE PRESENT WORK EXAMINES SOME PROPERTIES OF POLYMERIZATION OF THESE MONOMERS. THE HYPOTHESES WERE CONFIRMED. THE POLYMER IS A SOLUBLE MICROGEL. THE POSSIBILITY OF INDUCING POLYMERIZATION OF VINYL MONOMERS WITH MICROGELS OF POLYVINYLSILOXANES WAS ESTABLISHED, AND RADIOLYSIS AND POLYMERIZATION OF POLYFUNCTIONAL VINYLSILOXANES WERE STUDIED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 842 191 7/5 11/10
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

STUDY OF RADIATION-INDUCED POLYMERIZATION. PART VI: RADIATION-INDUCED POLYMERIZATION OF CHLOROPRENE, (U)

68 22P IVANOV,V. S. ;MEDVEDEV,YU. V. ;IVANOVA,L. I. ;
REPT. NO. FSTC-HT-23-209-68
PROJ: FSTC-82236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF LENINGRAD UNIV. VESTNIK (USSR) V20 N22 SERIYA FIZIKI I KHIMII, N4 P154-164 1965.

DESCRIPTORS: (*CHLOROPRENES, POLYMERIZATION), (*POLYMERIZATION, *RADIATION CHEMISTRY), GAMMA RAYS, DOSE RATE, TEMPERATURE, STABILIZATION, ADDITIVES, MOLECULAR WEIGHT, FREE RADICALS, IONS, CROSSLINKING(CHEMISTRY), ELASTOMERS, TRANSITION TEMPERATURE, USSR (U)
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, *RADIATION POLYMERIZATION, TRANSLATIONS (U)

THE PURPOSE OF THE WORK WAS THE STUDY OF RADIATION POLYMERIZATION OF CHLOROPRENE UNDER CONDITIONS WHICH PRESENT SPONTANEOUS POLYMERIZATION AND THE STUDY OF THE INFLUENCE OF THE DOSE, DOSE RATE, POLYMERIZATION TEMPERATURE, GASEOUS MEDIA, TYPE AND CONCENTRATION OF STABILIZERS ON THE YIELD, AVERAGE MOLECULAR WEIGHT, AND CERTAIN PROPERTIES OF THE POLYMERS. THE RADIATION POLYMERIZATION OF CHLOROPRENE TAKES PLACE AT +20C BY A FREE-RADICAL MECHANISM. AN IONIC MECHANISM BEGINS TO TAKE PLACE AS THE TEMPERATURE DROPS BELOW 20C. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 850 946 7/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C

PRIMARY PRODUCTS OF THE RADIOLYSIS OF WATER AND THEIR REACTIVITY, (U)

68 56P PIKAEV,A. K. ;ERSHOV,B. G. ;

REPT. NO. FSTC-HT-23-136-68
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF USPEKHI KHIMII (USSR) V36 N8 P1427-1459 1967.

DESCRIPTORS: (*WATER, *RADIATION CHEMISTRY), (*HEAVY WATER, RADIATION CHEMISTRY), REACTION KINETICS, HYDROXIDES, FREE RADICALS, HYDROGEN, HYDROGEN PEROXIDE, DECOMPOSITION, USSR (U)
IDENTIFIERS: *RADIOLYSIS, ELECTRONS, SOLVATES, TRANSLATIONS (U)

THE RADIOLYTIC CONVERSIONS IN AQUEOUS SOLUTIONS RESULTING FROM REACTIONS OF DISSOLVED SUBSTANCES WITH THE RADIOLYSIS PRODUCTS OF WATER ARE DISCUSSED. RESEARCH ON THE PHYSICAL AND CHEMICAL PROCESSES OF HYDRATION IS OUTLINED AND ILLUSTRATED BY [illegible]ATIONS ON HYDRATED ELECTRONS, OH AND HO2 RADICA[illegible] KINETICS OF EXCITED WATER, H2 AND H2O2 MOLECULAR PRODUCTS AND MAXIMUM YIELDS FROM WATER DECOMPOSITION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A008 148 7/5 6/1 6/18
ARMED FORCES RADIOBIOLOGY RESEARCH INST BETHESDA MD

FREE RADICAL-INDUCED CHAIN BREAKAGE IN IRRADIATED AQUEOUS SOLUTIONS OF DNA, (U)

MAR 74 21P MEABURN,G. M. ;COLE,C. M. ;

REPT. NO. AFRRI-SR74-3
PROJ: DNA-NWED-QAXM
TASK: C907

UNCLASSIFIED REPORT

DESCRIPTORS: *DEOXYRIBONUCLEIC ACIDS, *RADIATION EFFECTS, *RADIATION CHEMISTRY, HYDROXYL RADICALS, NUCLEOTIDES, DAMAGE, BIOCHEMISTRY (U)

THE EXTENT OF CHAIN BREAKAGE INDUCED BY FREE RADICAL ATTACK OF CALF THYMUS DNA IN DILUTE AQUEOUS SOLUTION HAS BEEN DETERMINED BY ASSAY OF LIBERATED PHOSPHOMONOESTER GROUPS. THE RELATIVE EFFECTIVENESS OF HYDROXYL RADICALS AND HYDRATED ELECTRONS AS INITIATORS OF THIS TYPE OF DAMAGE WAS INVESTIGATED IN BOTH NATIVE AND DENATURED DNA EXPOSED TO 60CO GAMMA AND 40 MEV ELECTRON RADIATION IN THE ABSENCE OF OXYGEN. APPROXIMATELY 8 PERCENT OF AVAILABLE OH AND 6 PERCENT OF HYDRATED ELECTRONS REACT TO PRODUCE CHAIN BREAKS IN DOUBLE-STRANDED DNA, WHEREAS THESE VALUES ARE REDUCED TO 5 PERCENT AND 1-2 PERCENT RESPECTIVELY, FOR THE DENATURED MATERIAL. THE DOUBLE HELICAL POLYNUCLEOTIDE STRUCTURE PROVIDES PROTECTION FOR REACTIVE SITES ON THE BASES WHICH ARE FULLY EXPOSED TO ATTAACKING RADICALS IN SINGLE-STRANDED DNA. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A012 024 7/5 7/2 7/4
CALIFORNIA UNIV LOS ANGELES INST OF GEOPHYSICS AND PLANETARY PHYSICS

THE CHEMISTRY OF MATERIALS UNDER EXTREME ENVIRONMENTAL CONDITIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 DEC 70-31 MAR 75,
75 18P LIBBY,W. F. ;
CONTRACT: AF-AFOSR-2019-71
PROJ: AF-9538, AF-6813
TASK: 953802, 681303
MONITOR: AFOSR TR-75-0834

UNCLASSIFIED REPORT

DESCRIPTORS: *CATALYSTS, *RARE EARTH COMPOUNDS, *PLASMAS(PHYSICS), *RADIATION CHEMISTRY, SCIENTIFIC RESEARCH, ATMOSPHERIC CHEMISTRY, RADIOLYSIS, IONIZING RADIATION, CRYSTALS, DIAMONDS, HIGH PRESSURE, PLANETARY ATMOSPHERES (U)
IDENTIFIERS: *ELECTRON TUNNELING (U)

RESEARCH IS BRIEFLY SUMMARIZED IN THE AREAS OF RARE EARTH AUTO EXHAUST CATALYSTS, PLASMA CHEMISTRY, HIGH PRESSURE INORGANIC CHEMISTRY, RADIATION DAMAGE IN CRYSTALS, ELECTRON TUNNELING IN CHEMISTRY, AND HIGH PRESSURE ORGANIC CHEMISTRY. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A018 510 7/5 20/12
CALIFORNIA INST OF TECH PASADENA ARTHUR AMOS NOYES LAB OF CHEMICAL PHYSICS

AN APPROACH TO THE UNDERSTANDING OF RADIATION CHEMISTRY IN THE CONDENSED PHASE. (U)

FEB 75 6P BERG,JACQUELINE O. ; ROBINSON,G. WILSE ;
CONTRACT: DAHC04-74-C-0010
MONITOR: ARO 11783.6-C

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CHEMICAL PHYSICAL LETTERS, V34 N2 P211-215, 15 JUL 75.

DESCRIPTORS: *RADIATION CHEMISTRY, *RELAXATION, *SOLID STATE CHEMISTRY, *ENERGY LEVELS, EXCITATION, ENERGY CONVERSION, ELECTRONS, IONS, FISSION, SOLID STATE PHYSICS, REPRINTS (U)
IDENTIFIERS: CONDENSED PHASE (U)

THIS PAPER DESCRIBES A PURELY ELECTRONIC MECHANISM BY WHICH APPROX. 20 EV EXCITATIONS IN CONDENSED PHASES RELAX TO LOWER ENERGY STATES. THE MECHANISM UTILIZES AN ENERGY FISSION PROCESS WHEREBY AN IONIC OR EXCITONIC STATE SPLITS INTO TWO LOWER ENERGY STATES, AT LEAST ONE BEING LOCALIZED. THE MECHANISM EXPLAINS NOT ONLY THE KNOWN RAPIDITY OF SUCH PROCESS BUT ALSO SUGGESTS AN EXPLANATION FOR THE PROPORTIONATION OF THE CHEMISTRY BETWEEN IONIC AND ELECTRONICALLY EXCITED STATES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A041 602 7/4 7/5
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

RADIATION DEGRADATION OF ALPHA-SUBSTITUTED ACRYLATE POLYMERS AND COPOLYMERS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUL 77 16P HELBERT,JOHN N. ;CAPLAN,
PHILIP J. ;POINDEXTER,EDWARD H. ;
REPT. NO. ECOM-4505
PROJ: 1L161102AH47
TASK: S7

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF APPLIED POLYMER SCIENCE, V21 P797-807 1977.

DESCRIPTORS: *POLYMERS, *COPOLYMERS, *RADIATION CHEMISTRY, ELECTRON BEAMS, DEGRADATION, ELECTRON IRRADIATION, CROSSLINKING(CHEMISTRY), REPRINTS (U)
IDENTIFIERS: WU011, ASH47, PE61102A (U)

RADIATION DEGRADATION IS OBSERVED IN POLY(METHYL ALPHA-CHLOROACRYLATE), POLY(METHYL ALPHA-CYANOACRYLATE), AND POLY(ALPHA-CHLOROACRYLONITRILE) HOMOPOLYMERS AND THEIR RESPECTIVE MMA COPOLYMERS WHEN GAMMA-IRRADIATED IN VACUO. POLYMER DEGRADATION SUSCEPTIBILITIES ARE QUANTIFIED IN TERMS OF G(SCISSION RADICALS) AND G(SCISSION)-G(CROSSLINKS), MEASURED BY EPR AND MEMBRANE OSMOMETRY, RESPECTIVELY; VALUES BY THESE TWO METHODS ARE COMPARED. HIGHER G(RADS) VALUES RANGING FROM 2 TO 6 AND (G(S)-G(X)) VALUES RANGING FROM 2 TO 11 ARE OBTAINED FOR THE SUBSITUTED POLYMERS AND COPOLYMERS RELATIVE TO THE VALUES FOR PMMA (1.6; 1.9), A STANDARD E-BEAM POSITIVE RESIST, WHICH SUGGESTS THAT THESE MODIFIED POLYMERS ARE MORE SENSITIVE E-BEAM RESISTS THAN PMMA. (AUTHOR) (U)

CORPORATE AUTHOR - MONITORING AGENCY

*AEROJET-GENERAL NUCLEONICS SAN RAMON CALIF

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AN1048
SELECTED SYNTHESIS BY FISSION FRAGMENT RECOIL.
AD- 422 205

*AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO

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ASD-TDR63 697
RADIATION PHYSICS: ITS IMPACT ON INSTRUMENTATION.
AD- 428 970

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ASD-TDR63 785
ELECTRON SPIN RESONANCE (ESR) STUDY OF GAMMA IRRADIATED SOLID ACETONITRILE.
AD- 423 525

*AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

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TR-0158(3250-20)-1
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*AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

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ARL 65-101
RARE GAS SENSITIZED RADIOLYSIS OF ACETYLENE,
AD- 616 958

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ARL-65-102
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AD- 618 155

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ARL-65-157
RADIATION CHEMISTRY OF ALKYL HALIDES.
AD- 632 704

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ARL-67-0110
MASS SPECTROMETRIC INVESTIGATION OF H, AND H2 TRANSFER REACTIONS OF HYDROCARBON IONS,
AD- 661 875

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ARL-67-0114
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IONIC REACTIONS IN ETHYL CHLORIDE,
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GNE/PH/65-9
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*AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO

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AFML-TR-65-236
THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS.
AD- 621 719

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AFML-TR-66-33
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AD- 634 859

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AFML-TR-66-2921
A STUDY OF ENERGY TRANSFER PROCESSES IN RADIATION CHEMISTRY: TRIPLET-TRIPLET TRANSFER IN POLYBUTADIENE.
AD- 639 389

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*AIR FORCE OFFICE OF SCIENTIFIC RESEARCH BOLLING AFB D C

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AFOSR-68-0941
NATURE OF THE INTERACTION OF SECONDARY ELECTRONS WITH CHEMICAL SYSTEMS.
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AFOSR-68-2236
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INTRAMOLECULAR ELECTROSTATIC ELECTRON TRAPS,
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POLYMER PRODUCTION IN THE GAMMA RADIOLYSIS OF METHANE IN LIQUID ARGON,
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AFOSR-563
CHEMISTRY OF POSITIVE IONS. I. GENERAL THEORY PARTICULARLY FOR THE RADIATION INDUCED CROSS LINKAGE OF POLYMERS AND POLYMERIZATION OF SATURATED HYDROCARBONS,
AD- 613 305

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PHOTOCONDUCTIVITY IN GAMMA-IRRADIATED ALKALINE ICE,
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AFOSR-TR-71-0653
SCAVENGER EFFECTS ON ELECTRONS PRODUCED BY GAMMA RAYS AND PHOTOIONIZATION IN ALKALINE ICES AT 77 K,
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CHEMISTRY OF RADIATION PROTECTING AGENTS.
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TRAPPED HYDROGEN ATOMS PRODUCED BY GAMMA RAYS IN ALCOHOL-WATER MIXTURES AT 77/K,
AD- 723 708

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AFOSR-TR-71-1456
THE RADIOLYSIS OF OXYGENATED CYSTEINE SOLUTIONS AT NEUTRAL PH. THE ROLE OF RSSR AND OXYGEN,
AD- 724 224

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AFOSR-TR-71-1463
RADIATION-INDUCED CHAIN ISOMERIZATION OF CIS-1,2-DIPHENYLPROPENE IN CYCLOHEXANE,
AD- 724 226

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AFOSR-TR-71-1705
OPTICAL ABSORPTION CHARACTERISTICS AND PHOTOBLEACHING BEHAVIOR OF TRAPPED ELECTRONS IN GAMMA-IRRADIATED ALKALINE ICE,
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AFOSR-TR-71-2402
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